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International Sells $26,500,000 Bonds

Four Insurance Companies Pay Par For 3⅝% Lien — Represents Further Important Step In Simplifying Capital Structure and Provides Permanent Medium For Handling Future Requirements.

Richard J. Cullen, President of International Paper Company, announced today that the Company has sold privately to four insurance companies at 100 and accrued interest $26,500,000 of its first lien and general mortgage bonds 3⅝% series, dated April 1, 1941, due April 1, 1956.

This financing not only represents a further important step in simplifying the Company's capital structure, but also provides a permanent medium for handling future bond capital requirements.

Insurance Companies Represented

The respective participations of the four insurance companies are: The Equitable Life Assurance Society of the U. S. $12,500,000; Metropolitan Life Insurance Company $9,000,000; John Hancock Mutual Life Insurance Company $3,500,000; and Massachusetts Mutual Life Insurance Company $1,500,000. Arrangements for the sale of the bonds were made through The First Boston Corporation and Smith, Barney & Co.

What the Proceeds Are Being Used For

The bulk of the proceeds from the sale of the bonds are being used:

(1) To redeem on July 12, 1941, at 101½ and accrued interest, $9,928,000 Southern Kraft Corporation first leasehold and general mortgage bonds, 4¼% series due 1946. This represents the entire outstanding balance of the Southern Kraft issue after the regular sinking fund operations which required call of $705,000 bonds for redemption on March 4, 1941, and an additional $300,000 for redemption on July 3, 1941. Both sinking fund redemptions were at 100 and accrued interest.

(2) To refund the secured bank loans of International Paper Company which amounted to $9,187,500. These bank loans, which were in the form of secured sinking fund notes due 1941-1944 with interest from 2¾% to 4¼%, have been paid in full.

(3) To provide $4,500,000 cash for new construction. This cash has been deposited with Chemical Bank & Trust Company subject to withdrawal against 60% of the cost or fair value of additions and improvements to the Southern Kraft properties.

(4) To reimburse the Company for the cost of the acquisition of the steam and steam-electric plant near Mobile, Ala., purchased in April at a cost of $1,750,000. This plant has heretofore supplied under contract the bulk of the steam and electric power requirements of Southern Kraft's Mobile mill. The purchase of the plant will permit considerable savings in power and steam costs at this mill.

Security for the Bonds

The bonds are secured by a first collateral lien on the Springhill, La., Georgetown, S. C., Panama City, Fla., and Mobile, Ala., mills of Southern Kraft Corporation which are the most modern and most profitable properties now controlled by International Paper Company. In addition they will be secured by a collateral lien, subject to the International Paper First and Refunding 5s, on the more important of the other properties of Southern Kraft Corporation and by a mortgage, subject both to the First and Refunding 5s and to the Refunding 6s, on substantially all the directly owned properties of International Paper Company.

The bonds are issued under an Indenture to Chemical Bank and Trust Company and Howard B. Smith as trustees. Additional bonds of different series may be issued up to 60% of the cost or fair value of additions and improvements to the Company's properties. A semi-annual sinking fund in gradually increasing amounts is provided to retire over 75% of the present issue of bonds prior to maturity.

Mr. Cullen also announced today that International Paper Company had redeemed at par on June 9, 1941 the $2,209,080 secured promissory notes due serially to December 31, 1944, issued last December in connection with the acquisition of Agar Manufacturing Corporation. Funds for the redemption of these notes were obtained by a $3,000,000 unsecured four year term loan at 1¾% from Chase National Bank, First National Bank of Boston and Bankers Trust Company. The new loan matures in semi-annual installments of $375,000 every six months from December 10, 1941 to June 10, 1945.

Westbrook Steele Gold Medal To Be Awarded

Robert A. Stillings Graduating From Lawrence College On June 9 Has Been Selected To Receive Medal At the Institute of Paper Chemistry—Nekoosa-Edwards Signs Labor Contract—Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., June 9, 1941—Using as the subject of his thesis for the doctor of philosophy degree an investigation of the action of ultraviolet ray on cellulose, Robert A. Stillings of Missoula, Mont., was selected to receive the Westbrook Steele gold medal at the Institute of Chemistry here.

This is the first year the medal was awarded by Mr. Steele, who is executive director of the Institute. It is to be presented annually on consideration of the following factors: An understanding of the relationship of the subject of investigation to the broader problems of pulp and papermaking; originality and soundness of approach to the subject; ingenuity of technics, thoroughness; character of research notes and craftsmanship in preparation and presentation of dissertation.

Mr. Stillings is one of twenty-five students receiving graduate degrees at the commencement exercises at Lawrence College, with which the Institute is affiliated, to be held Monday, June 9.

Ten who will receive the doctor of philosophy degree besides Mr. Stillings are: Harold Charbonnier, James d'A. Clark, Kenneth Hay, John Hechtman, Glenn Kimble, William Marteny, Shirley Parsons, Robert Reed, George Sheets and Paul Wiley.

Fourteen will receive the master of science degree as follows: Daniel Adams, Archie Deutschman, Paul Hansen, James Harrison, George Knight, Edwin Loutzenheiser, Keith Max, John McEwen, Jules Perot, Frederick Schelhorn, Philip Shick, John Turk, Robert Van Nostrand and Albert Yundt.

Lawrence College Elects Trustees

At the annual meeting of the board of trustees of Lawrence College, June 6, at Riverview Country Club, Appleton, Charles S. Boyd, president of the Appleton Coated Paper Company, Appleton, was elected to the board. He succeeds A. C. Gilbert, president of the Gilbert Paper Company, Menasha, Wis., who resigned. Mr. Boyd had previously served on the board from 1915 to 1938. F. J. Sensenbrenner, president of Kimberly-Clark Corporation, Neenah, Wis., was reelected vice-president of the board.

Nekoosa-Edwards Signs Labor Contract

The annual labor contract between the Nekoosa-Edwards Paper Company, Port Edwards, Wis., and three AFL unions representing employees was signed at the company's offices May 29, according to announcement of John E. Alexander, president. It embodies the wage increase of three cents per hour granted as of April 1, and provides another increase of two cents per hour effective October 1, 1941. A vacation plan was approved, effective June 1, which provides that employees with the company over ten years will be given one week, with 40 hours' pay. Workers employed over three years will be given proportionate vacations with pay. Union signatories were the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, the International Brotherhood of Paper Makers, and the International Association of Machinists.

A five-cent per hour wage increase for all hourly workers, both men and women, was announced last week by the Ahdawagam Paper Products Company, Wisconsin Rapids, Wis. The new base rate, retroactive to May 1, is 63 cents per hour, while the base rate for women workers is increased to 50 cents per hour. Starting rates for new employees will be below the base rates. A week's vacation with 40 hours' pay will be given all workers on the payroll two years prior to January 1, 1941.

The contract is the eighth annual agreement with the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, and was executed with the unions by Frank R. Walsh, manager.

Additions Made to National Forests

Substantial additions have been made to the national forests in Wisconsin, Michigan and Minnesota through purchases approved by the National Forest Reservation Commission.

In Wisconsin, 359 acres will be added to the Chequamegon National Forest at a cost of $897; Michigan—Manistee forest, 1,801 acres, $4,172, Huron, 12 acres, $580, and Ottawa, 1,936 acres, $19,504; Minnesota—Superior 5,456 acres, $11,349, and Chippewa, 635 acres, $2,172.

Backwater Land Appraised

In a jury case tried at Stevens Point, Wis., last week, the value of land taken by backwater of the Consolidated Water Power and Paper Company's dam at that city from Mr. and Mrs. Peter Kawleski was placed at $300. The couple had started a suit for $1,500. Another suit for $1,000 is pending against the company, brought by Mr. and Mrs. Joseph Kieliszewski.

Sportsmen's Petition Denied

Petitions of the Stratford Rod and Gun Club to the Wisconsin Public Service Commission to establish a higher minimum pond level at the Big Eau Pleine storage reservoir have been denied. The reservoir, operated by the Wisconsin Valley Improvement Company and supplying water to paper mills along the Wisconsin River, is one of the largest in the state. The commission found that the higher water level would not aid the problem of fish life and fish propagation. Paper mill engineers opposed the project at a recent hearing.

Badger Mill Employees Hold Dance

Four hundred employees of the Badger Paper Mills, Inc., enjoyed a dinner-dance Saturday evening, June 7, at the high school gymnasium at Peshtigo, Wis. E. A. Meyers, president of the company, spoke briefly, and Walter Adrian served as toastmaster. The principal address was made by the Rev. F. B. McDowell, pastor of the First Presbyterian

Church, Menominee, Mich. Musical entertainment was furnished, and dancing concluded the event.

Memorial Erected to Mrs. Mead

An imposing memorial to the memory of the late Ruth Witter Mead, wife of George W. Mead, president of the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., has been placed in Forest Hill cemetery there. It is the work of Leonard Crunelle, noted Chicago sculptor. The memorial is a heroic bronze, with the draped figure of a woman with right hand outstretched and the left hand holding the classical lamp of life. It is the artist's interpretation of the theme, "Onward." The statue rests upon the polished granite prow of a ship. The landscaped setting was conceived by Phelps Wyman, landscape artist of Milwaukee, Wis.

George Schmid Goes to Felulah Co.

George C. Schmid, formerly of Neenah, Wis., has accepted a position as technical director of the Felulah Paper Company, Fitchburg, Mass., and will assume his duties July 1. For the last five years he has been assistant superintendent of the Michigan Paper Company, Plainwell, Mich.

W. H. Swanson to Address Paper Men

W. H. Swanson of the Kimberly-Clark Corporation, Neenah, Wis., and national president of the Technical Association of the Pulp and Paper Industry left last week for Portland, Oregon. He was scheduled to speak at the joint meeting of the Pacific coast sections of TAPPI and the American Pulp and Paper Mills Superintendents Association in session June 6 and 7. Mr. Swanson also intended to go to Los Angeles for an address June 11 at a meeting of the Paper Makers and Associates of Southern California. His subject there was to be "The Technical Association's Place in Industry."

Scott Launches Pulp Carrier

The Scott Paper Company, Chester, Pa., has launched its first pulp-carrying vessel at the Camden, N. J., shipyard of John H. Mathis & Co., to be known as the "Arthur Hoyt Scott." The vessel is 269 feet long, with a displacement rating of 5270 tons and a cargo capacity of 3500 tons, divided into three cargo holds. It will be propelled by a Diesel type engine, with capacity to develop a speed of 10½ knots per hour. The carrier will be used to transport pulp from company mills at Nova Scotia, Canada, and Brunswick, Ga., to main manufacturing plant at Chester. The company plans to add additional vessels for similar service if the operation of this first pulp-carrier is as now anticipated.

Sherman Andersen Goes With Bryant

DEXTER, N. Y., June 9, 1941—Announcement is made here that Sherman Anderson, who resigned recently as superintendent of the finishing department of the Dexter Sulphite Pulp and Paper Company, has accepted the position as assistant superintendent of conversion at the Bryant Paper Company, Kalamazoo, Mich. He had been connected with the local company for nearly thirty years and had been in charge of the finishing department for the greater part of that time. He is a native of Minnesota. During his residence here he has been prominent in fraternal circles.

Fix Wage for Converted Paper Workers

WASHINGTON, D. C., June 11, 1941—Adopting the recommendation of a committee appointed to study the industry, General Philip B. Fleming, administrator of the Wage and Hour Division, U. S. Department of Labor, today issued a wage order establishing minimum wage scales of 40, 38 and 36 cents per hour in the converted paper products industry. The order, effective June 30, will increase the wage rates of almost 50,000 workers.

In issuing the order, General Fleming announced adoption of the committee's recommendation establishing minimum wage scales for each of 33 product divisions of the industry. The industry is distributed throughout the nation, with some phases to be found in virtually every state.

More than one-third of the employees in the industry are girls and women. Probably more than half the persons to be given wage rates increases are women, as they are the lowest paid workers in this industry. There are 2,120 separate establishments in the industry employing about 200,000 workers.

The committee, appointed by General Fleming in accordance with Section 8 of the Fair Labor Standards Act which provides for committee recommendations of wage rates up to 40 cents per hour for individual industries when such recommendations "will not substantially curtail employment in the industry," was composed of 27 members, an equal number selected to represent labor, employers and the public. A member of the public group, Wayne Lyman Morse, Dean of the University of Oregon Law School, Eugene, Oregon, was chairman. A public hearing was held following the committee's recommendation.

Products included in the 40-cents per hour minimum rate are: folding paper boxes; shipping containers; paper cups; bottle caps and hoods; waxed papers; waterproof paper; glazed and fancy papers; commercial envelopes; tags and labels; gummed papers; carbon paper; towels and toilet tissues; auto panels; photo mountings; die cut specialties; sensitized papers; sand paper; loose-leaf and blank books, tablets and pads, and index cards; stationery; playing cards; book matches; all other products in which the principal basic component consists of synthetic materials; all other products made by the coating or impregnating of paper or paper board with any material.

The 38-cent minimum applies to workers engaged in the manufacture of: shipping sacks; paper bags; miscellaneous rolls and wrapping specialties; products not elsewhere classified.

Included in the 36-cent minimum grouping is the manufacture of: set-up boxes; cans, tubes, cores and related products; expanding envelopes and related products; plain rolls; lace and fluted paper products; twisted paper products.

Divide Cigarette Paper Exports

WASHINGTON, D. C., June 11, 1941—Negotiations between German and French representatives regarding exports of cigarette paper and a division of markets have led, according to reports appearing in the German trade press, to an agreement whereby Germany will have a free hand as respects sales in countries to the east of the Reich while France will supply western Europe as well as North and South America.

Forest Fires Damage Pulpwood Reserves

Fires In Lake St. John District of Quebec Burn 250 Square Miles of Virgin Forest—Timber Lands of Consolidated Paper Co. and Other Concerns Injured—Price of Newsprint—Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., June 9, 1941—Forest fires have been raging in the Lake St. John district unchecked for over a week, and at the week end despatch from Chicontimi reported that 250 square miles of virgin forest, valued at some $1,000,000 at least, had been burned. The fires have been so serious that for several days the city of Montreal has been overcast by a mist of smoke through which the sun has pierced at intervals. The fires have been hard to check because the woods are tinder dry, no rain of consequence having fallen since the snow went.

Reserves of Pulp and Paper Damaged

One of the worst of almost countless separate blazes raged within the forestry reserves of Consolidated Paper Company and neighboring companies, destroying or damaging 15 timber-yards, 10 mill-dams and a number of small bridges. So dense was the smoke over the district that planes attempting to direct the fire-fighting were forced to fly 10,000 feet above the flames.

More than 2,000 men are battling against the worst outbreak of fires in the Lake St. John district on record, with 600 of them attempting to hold back flames that swept into the reserves of Price Brothers paper company and Quebec Pulp Company. It was estimated that altogether the various fires covered an area of almost 2,000 square miles.

The situation is so serious that all permits to travel in the forests have been suspended and issuance of new ones has been forbidden.

Price of Newsprint

Following the decision recently announced in New York by the International Paper Company the leading newsprint operators in Canada have informed their customers that the present price of newsprint will remain unchanged for the third quarter of 1941. In doing so they remind their clients that there has been no increase in the price of newsprint since January, 1938, and that the present price is maintained in spite of heavy increase in costs resulting from higher prices for materials, increases in labor rates, higher cost of transporting raw materials and finished products and a further item, namely, that of increased taxation.

Paper Industry's Defense Effort

The Canadian Pulp and Paper Association has issued a statement giving particulars of the mobilization of its machine shop facilities and technical staff for war purposes recently announced in the Paper Trade Journal.

In brief, this is what Canada's pulp and paper industry, through the efforts of individual companies, is doing to aid machine shop output throughout the Dominion: Educating skilled workers from the general mill staff of pulp and paper mills so there will be a steady flow of capable workers to replace those released or loaned to war industries; releasing or loaning technically trained staff and skilled workers to form the backbone of organization needed to operate war industries now expanding or about to come into operation; using machine shops existing at all pulp and paper mills to make the smaller parts and assemblies needed to complete larger machinery units.

To understand the magnitude of the third part of this plan it must be realized that there are more than 75 pulp and paper mills in Canada which operate substantial machine shops for maintenance of their own machines and equipment. In them specially trained mechanics can carry out carefully selected work of the right type and character in a highly satisfactory manner.

Mill Machine Shops Busy

The machine shops in the pulp and paper mills normally operate one shift of 48 hours a week. This leaves 96 hours per six-day week in which they are available to do useful war work—if the work is brought to the tools. Today, through the Wartime Machine Shop Board of the Canadian Pulp and Paper Association substantial volume of work has been brought to the pulp and paper mills' machine shops. As a result, these machine shops are now busy twenty-four hours a day.

All these activities are so planned that this contribution to the country's war effort is made without impairing production of pulp and paper products. During 1940 the industry exported pulp and paper to the value of some $240,000,000—most of which represented U. S. dollars so vitally needed by the Empire today; for 1941 this figure will be even larger.

The pulp and paper industry, through planning and coordination is increasing its already effective contribution to Canada's war effort. The widespread and successful results achieved already by the Wartime Machine Shop Board indicate that this phase of pulp and paper mill activities will play an increasingly large part in winning the battle in this war of machines and equipment operated by resourceful Canadians.

W. C. Harley Buys Greene Machine Co.

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., June 8, 1941—William C. Harley, superintendent of the bag plant of Taggart Brothers, Inc., has purchased the plant and business of the Greene Machine Company, this city, and has already taken possession. The company manufactures machine specialties, especially knives for paper mills and has already built up a good business. The business will be continued by the new owner who plans to keep the present staff and develop the output of the concern. The Greene Machine Company was founded in the spring of 1922 by Alvin Greene and associated with him in the organization was his brother, C. Howard Greene, who disposed of his interest to the former several years ago. The purchase price was not disclosed.

Chicago Reports Large Scale Paper Buying

Demand For Many Grades of Paper Continues To Increase With More Activity In Book and Bond Papers This Week—Sales Volume In Some Specialties and Paper Board Mounting—Other News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., June 9, 1941—There is no indication of the normal summer recession in the Chicago paper market. On the contrary, local paper trade executives are wondering just how to fill the orders that are pouring in as buyers, convinced of the raw material situation and pressed by improved business nationally, are entering the buying markets on a large scale. The strong and significant upturn in books and bonds and the upper limits hit by the kraft market are all reflected in strength of groundwoods—which have an upsurge of their own—and virtually every other grade of paper. Mills are reported between eight and ten weeks behind with plenty of business on hand to either maintain that ratio or increase it during the summer period when, normally, a "catching up" process could take place. Even while increased taxes and serious shortages are up ahead, the local market is striving to maintain an even keel, to keep prices within bounds by preventing any talk of "hysteria" and is, in other words, doing everything possible to regulate itself without any government intervention. In addition to the above mentioned lines, board, specialties, newsprint and waste papers were all characterized as "strong" during the week.

Teaching Patience by Poetry

Some idea of the problem confronting the paper industry in filling orders without ruffling customers is evidenced in the poem now being sent out to customers of the Wausau Paper Mills Company. Supplied by Harold Knott, Chicago sales executive of the Company, the poem is headed "Your Back Order" and runs as follows:

"Keep your temper, gentle sir,
Writes the Manufacturer,
Though your goods are over-due
For a month or maybe two,
We can't help it, please don't swear
Wood's scarce and dirt rare.
Can't get Chlorine, can't get dyes,
These are facts, we tell no lies.

Harry's drafted, so is Bill,
All our work is now uphill.
Vacation time is here at last
Saturday work is a thing of the past.
So your order, we're afraid
May be still a bit delayed.
Still you'll get it, don't be vexed.
Maybe this month, maybe next.
If the heat don't get us down
And you call us with a frown,
Keep on hoping, don't say die,
We'll fill your order bye and bye.
Wausau Paper Mills Company.
P.S. NO FOOLIN'
We're working with all our speed
to fill your order and meet your need.

Salesmen Plan Golf Outing

Considerably pleased over the success of the initial golf outing in May, Ed Rolaine, chairman of the western division of the Salesmen's Association of the Paper Industry golf committee, is completing plans for the second golf holiday. The date is Friday, June 20, and the place will be the popular Park Ridge Country Club, scene of a number of paper salesmen's outings. Mr. Rolaine has also announced the rest of the summer schedule with the Bob-O-Link Golf Club host for the July 25 affair and the LaGrange Country Club the scene of the semi-final event on Friday, August 22. The S. A. P. A. will again hold its windup event in conjunction with the Fall meeting of the National Paper Trade Association and the dates will be in September to coincide with that three day session. The site will again be the Olympia Fields Country Club.

A.S.T.M. to Meet in Chicago

The American Society for Testing Materials will meet in Chicago, June 23 to 27 to hold an interesting discussion on "Problems and Practice in Determining Steam Purity by Conductivity Methods." The Palmer House will be the site for all the various programs scheduled. The discussion, scheduled for the annual meeting of the group on June 26, will be sandwiched in between a speaking program which will focus attention on the general round table itself. It should be most valuable and interesting to all interested in the determination of steam purity and a number of paper executives and mill superintendents and engineers are expected to be in attendance. The annual exhibit of testing apparatus and related equipment will be featured as a part of the American Society annual program and will be ready for visitors on the morning of June 23 when the convention gets under way.

Paper Board Prices

WASHINGTON, June 6, 1941—Leon Henderson, Federal Price Control Administrator, asserted today that recent increases in prices of some grades of paper board were "completely unjustified." He said he was considering the issuance of a formal price ceiling schedule to bring the prices down.

"Recent increases in prices for chip board to a level of $45 a ton, of single manila lined board to $60 a ton and of white patent coated newsboard to $75 and $80 a ton are considered completely unjustified in light of current raw material and labor costs," said Mr. Henderson. "In some cases sales are known to have been made at even higher levels than those quoted."

The paper board is used in the manufacture of kraft paper and corrugated paper boxes. Mr. Henderson met with representative producers on Monday. He said no agreement was reached regarding a proper price level.

Container Conviction Is Upheld By Court

Majority Ruling of Ontario Appeal Court Sustains Decision of Last September Imposing Total Fines of $161,500 On Many Canadian Manufacturers—Wilson Boxes, Ltd., Case Will Be Tried Again.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., June 9, 1941—With the exception of that in the case of Wilson Boxes, Ltd., Fairville, N. B., fines totalling $161,500 imposed on Canadian shipping container manufacturers and their control company, Container Materials, Ltd., for attempting to fix prices, were upheld by a majority ruling of the Ontario Appeal Court in a judgment just given out.

Awaiting Appeal Since September

The case has been awaiting appeal since last September 6, when Mr. Justice J. A. Hope imposed fines ranging from $2,500 to $10,000 on 19 manufacturers of containers and container materials in a prosecution brought by the crown against them for violation of Section 498 of the Canadian Criminal Code by combining in restraint of trade. There has been widespread interest in the case because of its possible bearing on other industries.

The finding of the Court of Appeal makes it clear that, while price control may become an important part of a wartime economy, the fixing of prices is the prerogative of governments and not the privilege of individuals and trades. Such a program as was adopted by manufacturers of shipping containers is definitely condemned.

Fines Imposed Upheld

All the fines imposed by Mr. Justice Hope last September are upheld, with one exception. In the case of Wilson Boxes, Ltd., where a fine of $5,000 was imposed, a new trial was ordered by the present judgment because of the trial judge's rejection of a document which has now disappeared.

The importance which the Court of Appeal attaches to the case is apparent from the fact that all five members of the court wrote their reasons for the judgment. Four members of the court, Chief Justice Robertson, and Justices Middleton, Masten and Fisher, upheld the conviction of the defendants, with the exception noted, while Justice Henderson dissented from the majority view.

The court action grew out of an investigation and report made by the commissioner of the Combines Investigation Act and it is understood that action under this Act against several other price-fixing organizations has been withheld pending decision in this case.

The decision has been awaited by the organizations themselves. It may be that enforcement measures will be rendered unnecessary by the voluntary abandonment of policies which have been condemned by the courts.

When the judgment of the trial court in the action against the shipping container firms was delivered last September, views were expressed in some quarters there might be some modification of the opinion of Justice Hope regarding elimination of price competition as an essential feature of illegal activity.

Court Opinion Clarifies Case

Chief Justice Robertson's judgment makes it clear that arrangements which impose restrictions upon the manufacturers' freedom to compete to the extent which was accomplished through Container Materials, Ltd., fall within the terms of Sec. 498 of the Combines Act.

The purpose of the arrangement, says the Chief Justice, "was to extinguish as far as those manufacturers were concerned, all competition in the barter and sale of these products in Canada, just as completely as if Container Materials, Ltd. had a monopoly of them."

The Chief Justice finds "there is grave danger if the manufacturers of the goods have the control of prices in their own hands . . . That danger, however, is one that arises from preventing or lessening competition against which clause 'd' of Sec. 498 is designed to provide."

In a dissenting judgment, Justice Henderson expresses the view "there are a thousand ways in which manufacturers can compete for trade, which are not interfered with by an agreement to maintain a price or in certain respects to standardize their products," and he would have acquitted the accused of any undue lessening of competition.

The trial judge had convicted the accused on four counts of conspiring to restrain trade. The Appeal Court upholds the conviction on one count—unduly preventing or lessening competition.

The Appeal Court found no evidence to warrant a conviction on the charge of unduly limiting manufacturing or distributing facilities.

On the question of enhancing prices, the Chief Justice found that an arrangement which fixes prices high enough to provide for operation of the pooling system, was evidence of conspiracy to unreasonably enhance prices, but as this aspect of the evidence was not presented to the Appeal Court, he did not think it proper to uphold conviction on that account.

Fines Imposed on Many Concerns

The fines levied by Mr. Justice Hope and confirmed by the Court of Appeal were: Container Materials, Ltd., $10,000; Shipping Containers, Ltd., $10,000; Standard Paper Box Company, Ltd., $10,000; Martin Hewitt Containers, Ltd., $10,000; Canadian Wirebound Box Company, Ltd., $10,000; Corrugated Paper Box Company, Ltd., $10,000; Gair Company, of Canada, Ltd., $10,000; Hinde & Dauch Paper Company, of Canada, Ltd., $10,000; Hygrade Corrugated Products, Ltd., $10,000; Hilton Brothers, Ltd., $10,000; Martin Paper Company, Ltd., $10,000; Acme Paper Box Company, Ltd., $10,000; Canadian Boxes, Ltd., $10,000; Maritime Paper Products, Ltd., $5,000; G. W. Hendershott Corrugated Paper Company, Ltd., $5,000; Kraft Containers, Ltd., $5,000; Superior Box Company, Ltd., $5,000; H. J. Badden, $4,000; and Dominion Corrugated Paper Company, Ltd., $2,500.

Program for Superintendents' Convention

Poland Spring House, Poland Spring, Me., June 17-19, 1941

Monday, June 16

1:00 P. M. Registration

7:00 P. M. Affiliates' Dinner

Tuesday, June 17

9:30 A. M. Registration

11:00 A. M. General Session—Ball Room, Poland Spring House Convention called to order
Arthur B. C. Drew, President, presiding
Invocation—Rev. H. E. Townsend, Pastor Universalist Church, Westbrook, Maine
In Memoriam—Robert L. Eminger, National Secretary
Address of Welcome—Hobart Kilgore, Selectman Town of Poland
Response—Oscar Stamets, First Vice-President
President's Message—Arthur B. C. Drew
Appointment of Committees

12:20 P. M. Joint Luncheon—Poland Spring House
Toastmaster—John E. Hyde, Vice-President, S. D. Warren Company, Cumberland Mills, Maine
Speaker—Governor Summer Sewall, Governor of Maine, Augusta, Maine

2:00 P. M. General Conference—Ball Room, Poland Spring House
Arthur B. C. Drew, President, presiding
Informative Papers
"Proper Use of Cypress in the Paper Mill", by John Reno, Florida-Louisiana Red Cypress Company, Jacksonville, Florida
"Current Methods of Purifying Water for the Paper Mill," by A. F. McConnell, The Permutit Company, 330 West 42nd Street, New York, N. Y.
"Recent Developments in Labor Legislation," by Alan Goldsmith, Vice-President, Mead Corporation, Chillicothe, Ohio.

7:00 P. M. Stag Dinner—Poland Spring House
Master of Ceremonies—C. W. Stewart, Parker-Young Company, Lincoln, N. H.
Entertainment

Wednesday, June 18

9:15 A. M. Board Meeting
Chairman Ollie W. Messner, Robertson Paper Box Co., Montville, Conn.
"The Dilts-Cowles Hydrapulper, Its Design and Application," by E. M. Root, Dilts Machine Works, Fulton, N. Y.
"Development of Stream-Flow Vat System," by Philip H. Goldsmith, Sales & Development Engineer, Pusey Jones Corporation, Wilmington, Del.
"Bring the Cylinder Machine Up to Date," by Leon E. Smith, Sales Engineer, Downingtown Manufacturing Company, Downingtown, Pa.

9:15 A. M. Fine Papers Meeting
Chairman: Daniel J. Walsh, Parker-Young Company, Lincoln, N. H.
"A New Means for Reclaiming Pulp," by Theodore P. Steinmetz, Norwood Engineering Company, Florence, Mass.
"Sandy Hill-Bertrams Flow Distributor—Control of Approach Flow to the Fourdrinier," by Allen A. Lowe, Field Engineer, Sandy Hill Iron and Brass Works, Hudson Falls, N. Y.
"Graduated Temperatures for Paper Machine Dryers," by Frederick C. Stamm, Armstrong Machine Works, Three Rivers, Mich.

9:15 A. M. Coated Papers Meeting
Chairman: Dr. Frederick Frost, S. D. Warren Company, Cumberland Mills, Me.
"The Known and Unknown Variables in Coating Coloring," by Dr. B. W. Rowland, Research Laboratory, Institute of Paper Chemistry, Appleton, Wis.
"Type of Starches Available for Coating and Their Characteristics," by Glen Price, National Starch Products, 15 Elkins Street, South Boston, Mass.
"Problems of Froth Control," by Edwin Sutermeister, S. D. Warren Company, Cumberland Mills, Me.
"Drying Coated Papers at High Speeds," by George Marsh, C. J. Merrill Co., Portland, Me.
"Different Types of Fillers for Calender Rolls," by Ward Wheeler, Wheeler Calender Roll Company, Kalamazoo, Mich.

9:15 A. M. Finishing, Storing and Shipping Meeting
Chairman: W. Douglas Sommerville, Eastern Corp., Bangor, Me.
"The Bracing of Rolls, Skids, and Bundles of Paper for Carload Shipment," by J. G. Bucuss, Sales Manager, Strapping Division, Acme Steel Company, 2840 Archer Avenue, Chicago, Ill.
"Governmental Requirements for Packaging Paper," by E. W. Spencer, assistant technical director, U. S. Government Printing Office, Washington, D. C.
"The Loading of Paper in Freight Cars for Shipment," by R. A. Fashold, Freight Claim Director, Association of American Railroads, Chicago, Ill.

9:15 A. M. PLANT AND POWER ENGINEERS MEETING

Chairman: Grover Keeth, Marathon Paper Mills Co., Rothschild, Wis.
Motion Picture, "Fabrication of Carbon Molybdenum Steel Piping for All Welded High Pressure High Temperature Steam Service," by S. J. Horrell, Blaw-Knox Company, Pittsburgh, Pa.

9:15 A. M. NEWS PRINT AND WRAPPING MEETING

Chairman: George E. Fuller, St. Croix Paper Company, Woodland, Me.
Round table discussions.

9:15 A. M. TISSUE MEETING

Chairman: Benjamin E. Teale, Crane & Co., Dalton, Mass.
Round table dicussions

12:20 P. M. Joint Buffet Luncheon—Outdoor Picnic in Grove.

P. M. Golf Tournament
Horseshoes—Soft Ball
Bowling on the Green—Skeet

5:00 P. M. Dorothy Mason Dancers on Lawn

7:30 P. M. Joint Dinner—Poland Spring House
Toastmaster—
Presentation of Sports Prizes
Entertainment
Dancing—Ball Room, Poland Spring House

Thursday, June 19

9:15 A. M. Group Meetings—Poland Spring House

CHEMICAL PULP MEETING

Chairman: Stanford G. Blankinship, Port Royal Sales Company, New York, N. Y.
"Cooking of Soda Pulp," by Dr. T. H. Werner and Rudolph T. Greep, S. D. Warren Company, Cumberland Mills, Me.
"Some Further Experiences with Forced Circulation," by D. C. Porter, Kimberly-Clark Corp., Neenah, Wis.
To be announced.
Quiz program.

12:20 P. M. Informal Luncheon—as you will.

2:00 P. M. General Conference—Ball Room, Poland Spring House
Arthur B. C. Drew, President, presiding
Report of Committees
Election of Officers
Resolutions
Informative Paper
"New Horizons of Science"—Dr. Philip Thomas, Westinghouse Electric Company, East Pittsburgh, Pa.

5:00 P. M. Band Concert on Lawn—S. D. Warren Company Band

7:30 P. M. Joint Banquet (Semi-Formal)—Poland Spring House
Toastmaster—Walter S. Wyman, President, Maine, Seaboard Paper Company, Bucksport, Maine
Speaker—Howard Pierce Davis, Columbia Broadcasting Company, New York, N. Y.
Presentation of Past President's Jewel
Presentation of L. D. Post Trophy
Dancing—Ball Room, Poland Spring House

LADIES' PROGRAM

Monday, June 16

All day reception and get-together for early arrivals.

Tuesday, June 17

9:30 A. M. Registration

12:20 P. M. Joint Luncheon at Poland Spring House

7:30 P. M. Ladies' Dinner—Mansion House
Entertainment — Mr. Henry Gerald, "Psychology In Action".

Wednesday, June 18

12:20 P. M. Joint Buffet Luncheon—Outdoor Picnic in Grove

5:00 P. M. Dorothy Mason Dancers on Lawn.

7:30 P. M. Joint Dinner—Poland Spring House
Dancing

Thursday, June 19

10:00 A. M. Ladies' Golf Tournament

12:20 P. M. Informal Luncheon—as you will

2:30 P. M. Ladies' Bridge — Lounge — Poland Spring House

5:00 P. M. Band Concert on Lawn—S. D. Warren Co. Band

7:30 P. M. Joint Banquet—Poland Spring House
Dancing

Government Paper Bids

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 11, 1941—Government Printing Office has received the following bids for 500,000 pounds of white sulphite writing paper in 48 inch rolls: Barton, Duer & Koch Paper Company, 5.86 cents; Mudge Paper Company, 6.95 cents; Paper Corporation of U. S., 6.25 cents; Marquette Paper Company, 6.66 cents (300,000 pounds only); and Eastern Corporation, 6.55 cents.

For 48,000 pounds (400,000 sheets) of 25 x 38 offset book paper: R. P. Andrews Paper Company, 7.8 cents; Paper Corporation of U. S., 7.12 cents; and Maxwell Paper Company, 7.12 cents.

For 72,588 pounds of 42 x 64 white sulphite writing paper and 106,575 pounds same 48¼ x 71¼; Paper Corporation of U. S., 6.8 cents; Butler Paper Company, 7.1 cents; and Eastern Corp., 6.79 cents.

For 40,870 pounds of 42 x 64 white sulphite manifold paper and 8,286 pounds same 24 x 31½; Perkins-Goodwin Company, 11.43 cents; and Paper Corp. of U. S., 8.95 cents.

For 14,400 pounds of 100% rag, white bond paper; Paper Corporation of U. S., 21.88 cents; Walker Goulard Plehn Company, 21.49 cents; Barton, Duer & Koch Paper Company, 23 cents; Old Dominion Paper Company, 19.847 cents; Whitaker Paper Company, 28.75 cents; Mudge Paper Company, 25.34 cents.

For 61,000 pounds of 28 x 34 white sulphite writing paper; R. P. Andrews Paper Company, 7.29 cents; Paper Corp. of U. S., 7 cents; Butler Paper Company, 7.45 cents; and Eastern Corporation, 7.13 cents.

Continuous Cutting Chippers*

By N. P. Wardwell[1]

Credit for the success of the continuous cutting chipper is due to two basic principles. The first is the use of two or more knives at one time in a stick. The second is the high number of cuts per minute, up to 6,000 on small chippers, which gives the logs no time to move between cuts. The former affects logs that are large enough diameter so that the surface exposed to the knives is longer than the distance between knives. The latter affects the smaller ones.

Two Knives in a Stick

Firstly, the knives do not cut straight down through logs, but dig their way deeper and deeper into the wood as they descend, thus pulling the log farther down the spout. The top of the log reaches the disc just in time for the next cut. There is nothing to stop this downward movement because the chips are being peeled off and are passing through the disc to make room for the continuously incoming flow of wood. On a four knife disc or on one whose knives are too far apart to catch a given size log, the log comes down to the disc after each cut and has to wait for the next knife to come. The progress toward the disc is intermittent, and much bouncing and rolling occurs during the waiting period. But when the principle of two knives in a stick can be applied, the progress toward the disc is continuous, and there is no bouncing or rolling. That means that the chips are just about perfect.

Higher Number of Cuts

Secondly, practice has shown that where conditions are such that two knives can catch a 7½ inch stick, a 4 inch stick will go through with results almost as good as with the 7½ inch size. The explanation of this is that the inertia of the log holds it from bouncing because the waiting period is so short with 3,000 cuts per minute as compared with 1,000 in the old four knife disc. This figure of 3,000 cuts per minute is a special case. Usually the number is higher. This principle only works within certain limits, but it is useful in extending the sphere of influence of the first principle to logs that are smaller than could be economically caught by two knives at one time.

Recent Tests

A recent test was made on a 56 inch ten knife chipper with 12½ inch spout running at 600 r.p.m. and blowing chips to the screen 15 feet above the shaft and 20 feet horizontal distance away. All the logs were weighed and measured. Half of them were 2 feet and the rest 4 feet long. The following figures were obtained from the average of three samples. The chipping was done for each sample with different condition of knives, the first newly ground, the second 28½ hours use without grinding but honed at 4 hour intervals, the third after chipping eight hours without treatment. So the average is representative. Knives are of the higher grade steel.

Weight of logs	10,831 lbs.
Sawdust passing ¼ inch perforated plate	153 lbs.
Per cent Sawdust	1.41%
Rejections retained on 1½ x 2 inch wire cloth	22 lbs.
Per cent Rejections	.2%
Moisture content	22-28%
Weight per cubic foot	26.44 lbs.
Log diameters	6 to 11 inches

Another mill with a 12-knife 84 inch disc on an old chipper with 14 inch spout, writes that only 5% of their chips are longer than the 1 inch length they require, and less than 1% pass ¼ inch mesh.

Another mill reports sawdust waste passing ¼ inch mesh on a .99% on a 12-knife 54 inch chipper with 12½ inch spout as compared with 1.81% on a 4-knife 88 inch chipper. This was an exhaustive test described by Mr. Savage in his paper at the Technical Section of Canadian Pulp and Paper Association in Montreal, January, 1941, published on page 107 of the February issue of *Pulp & Paper Magazine of Canada*. His report (not part of his paper) indicates that classifying screen tests should be picked over to prevent different length chips being retained on the same mesh but states that without classifying screens, tests such as his would be impossible.

Two other mills that we know of have discontinued the use of their re-chippers, and a third intends to do so soon because the oversized chips are so few.

Still another mill reports 1.7% sawdust through .141 inch opening mesh in a very carefully conducted test using 100 cords of spruce wood.

Chips Are More Uniform

Of the 35 chippers or discs which have been shipped up to this writing with 8 or more knives, many have not yet been heard from and five went to roofing mills where no comparison with previous operation was possible. But 18 including those specifically mentioned above have reported, and all agree that their chips are much more uniform and their sawdust is greatly reduced from what it was when they had only four knives. Some say their digester yield is improved.

With twelve foot logs or longer, troubles from bouncing and rolling are at a minimum, even with a 4-knife disc, especially when one log presses against the butt of the preceding one. The intermittent progress toward the disc, instead of the steady flow when there are two cuts in a stick wears the disc more as will be described later. The wear will cause bouncing and uneven chips and the butts will shatter more.

Most people seem to think that the size of a chipper determines its capacity. This is true in the extreme case where a chipper is powered and fed up to its limit. But in practice the smallest size chipper will

* Delivered by Frank P. Wilder at the annual meeting of the Pacific Section of the Technical Association of the Pulp and Paper Industry with the Pacific Division of the American Pulp and Paper Mill Superintendents' Association, Portland Hotel, Portland, Ore., June 6-7, 1941.

[1] Sec.-Treas., Carthage Machine Co., Carthage, N. Y.

turn out all that is needed for ordinary purposes if the necessary power is applied and the feeding is properly executed and the sticks are small enough for a spout. A small chipper with a 10 inch spout and 200 hp. attached can turn out 30 cords per hour of soft wood if the feeding arrangement is right. A chipper with a 19 inch spout and 200 hp. attached cannot turn out one bit more. So the factor determining the size of the chipper is the diameter of the largest log, and the factors determining capacity are power available and ability to feed.

Motor Applications

The synchronous motor for driving chippers, as in other applications, is at its best when the load is constant. For 12 foot or 16 foot or 20 foot logs or for a small chipper cutting 8 inch or 10 inch diameter logs, and requiring a high capacity, it is the best type of drive. The power factor correction, the increased efficiency without heat losses from slowing down, and the increased capacity because cuts per minute do not drop off during a big stick, all make it very desirable. But if short logs 4 feet or even 8 feet long are used and if the diameters vary considerably, the induction motors are better suited. The high slip squirrel cage or wound rotor types are recommended. In a chipper with a 19 inch spout, the load varies from 0 to 1540 hp. If a synchronous motor were used it would need to be large enough so that the combined rating and pullout torque equalled 1540 hp., and even then the sudden peak loads on the power line might sometimes be undesirable. But with an induction motor 200 hp. would be enough to turn out thirty cords an hour. The flywheel effect in disc and pulley is enough to carry the knives through the largest log without slowing down the motor more than the 10 to 15% limit which the motor manufacturers have set for safe and sane operation.

It is possible to direct connect induction motors. The rotors can be mounted on the chipper shaft just like the synchronous type. However, we prefer using flexible couplings because the air gap is smaller between the rotor and stator than in synchronous motors. Also when the chipper disc is moved endwise to adjust for knife clearance if the motor rotor moves with it the stator must be moved the same amount to keep the air ducts properly in line. This is a nuisance that might cause neglect of close knife adjustment.

Tests on Power

Many tests have been made on power and there is variation in results as must be expected. However, the evidence provides a basis for safe drive recommendations. And so if you use an induction motor, figure on 7 hp. per cord per hour. If you have a synchronous motor calculate the volume of your largest diameter log and multiply by 140,000 ft. # per cu. ft. to get the amount of energy necessary to chip that largest log. Then divide this by 550 ft. #/sec. and by the number of seconds necessary to chip the log as determined from cuts per minute and length of chip. This gives the combined rating and pullout torque horsepower required if most of the logs are smaller or the rated horsepower if most of them are that size.

Knives are set through the disc instead of on the surface partly to conserve space on the surface. This position also saves them from being rubbed by the logs, and they keep cooler. There is practically no heating even under the most adverse circumstances.

Sawdust Loss Cut Down

We don't like to compare knife life on the basis of length of time between grindings but prefer to use sawdust loss as an index of knife life while grinding at regular intervals such as once a shift. On this basis discs with knives in the new position in nearly every case have cut down the sawdust loss by at least 1% of the total wood. Part of this improvement can be credited to freedom from bouncing which would otherwise allow the knives to graze the ends of logs nipping off little particles. But much of it is the result of freedom from heating and of the fact that the edges are not turned by logs tipping up while being cut.

If welded knives are used the hard part is hammered into the soft backing instead of being torn away as is the tendency when they lie on the surface. Also there is less danger of the knives breaking away from the clamping bolts for the same reason.

The wear on the disc with the four knife chippers used to come half way between the knives. This was harmful because of the ocean wave effect causing the logs to bounce and roll. But with knives closer together the wear comes only at the chip opening edges. This wear might come more at the inside end of the knife than at the outside end and make longer chips inside. This can be corrected by grinding the chip opening edges even, all the way across and shortening amount of projection of the knives. The wear will become more gradual as the surface adopts itself to contact surface of the log. The pressure that causes the wear will be spread over more and more area. But aside from the gradual diminution of metal we have been unable so far to see any harm in this wear.

Buys Paper Under Walsh-Healey Act

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 11, 1941—During the week ended May 24 the government bought $3,256,175.78 worth of paper and allied products under the Walsh-Healey act, with orders that included the following:

$71,200.50 worth of envelopes for District of Columbia post office from Samuel Cupples Envelope Company; $69,905.65 worth of envelopes and jackets for District of Columbia post office from U. S. Envelope Company; $40,091.50 worth of paper for Navy, S&A from Mathers-Lamm Paper Company; $86,119.80 worth of paper, tags, for Navy, S&A from R. P. Andrews Paper Company; $22,399.20 worth of writing paper for Navy, S&A, from Barton, Duer & Koch Paper Company.

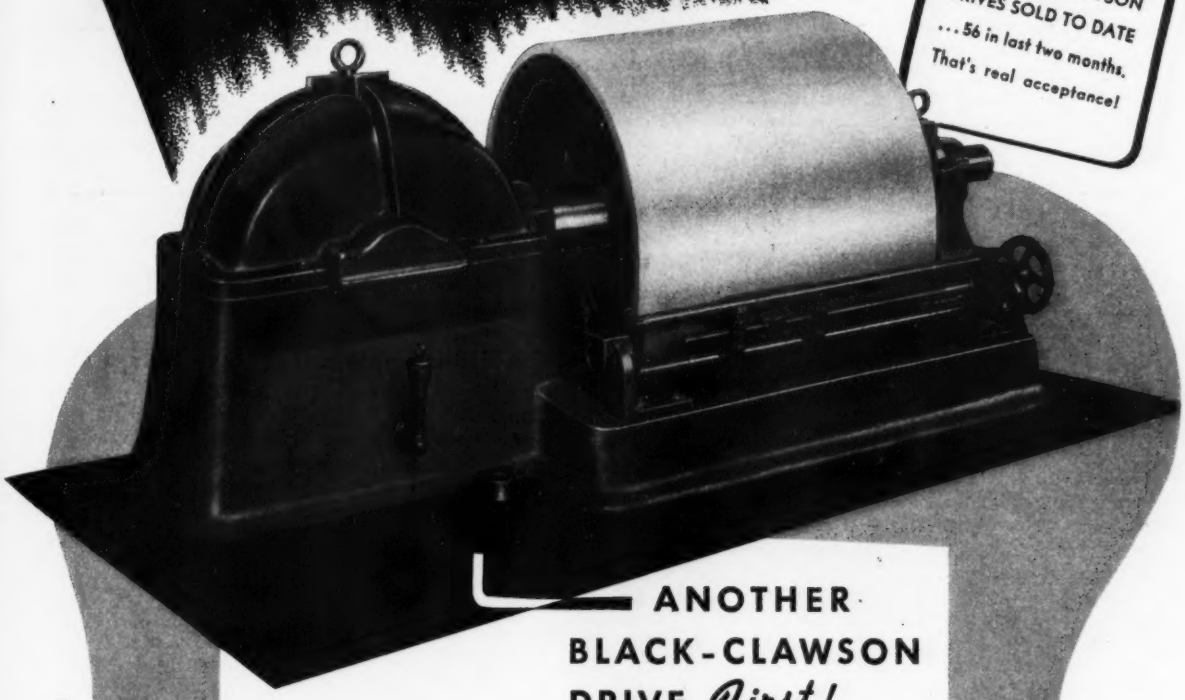
Raise Wages at Mechanicville

[FROM OUR REGULAR CORRESPONDENT]

MECHANICVILLE, N. Y., June 8, 1941—An increase of five cents per hour has been granted to all employes of the West Virginia Pulp and Paper Company which went into effect early this week. About 1,000 employees are affected. The concern has also adopted the plan of granting each employee a vacation of a week with pay where the employe has been in service for at least a year.

TOTALLY ENCLOSED BEARINGS

607 BLACK-CLAWSON DRIVES SOLD TO DATE ... 56 in last two months. That's real acceptance!



ANOTHER BLACK-CLAWSON DRIVE *First!*

- Black-Clawson drives used to have bearings partially exposed. Not that there was anything wrong with that arrangement, for there wasn't. But occasionally, an over-ambitious mill hand would tinker with these bearings, erroneously thinking he was helping out the adjustment.
- Invariably he made matters worse, for Black-Clawson drives are permanently adjusted even before they leave the shops.
- Now, the bearings are totally enclosed. They are sealed . . . inaccessible to "tinkerers" . . . tamper-proof. There's nothing on which you can stick a wrench.
- It's basic improvements such as this that make the Black-Clawson the finest paper mill drive. 56 have been sold in the last two months for a grand total of 607. A drive with such acceptance is the drive for you.

The Black-Clawson Company, Hamilton, Ohio.
Shartle Division, Middletown, Ohio.
Dilts Division, Fulton, N. Y.

BLACK-CLAWSON DRIVES

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending June 11, 1941

	High	Low	Last
A. P. W.	....	....	....
Armstrong Cork Co.	26	23⅛	26
Celotex Corp.	10⅛	9½	9½
Celotex Corp. pf.	68¾	66	66
Certain-Teed Products Corp.	3⅜	2⅞	3⅜
Certain-Teed Products Corp., pf.	29¼	25½	28
Champion Paper & Fibre Co.	....	....	....
Champion Paper & Fibre Co., pf.	105	104¼	104¾
Congoleum-Nairn Co.	15½	14½	15¼
Container Corp. of America	14¾	13¾	14⅝
Continental-Diamond Fibre Co.	8	8	8
Crown-Zellerbach Co.	12⅞	12	12⅞
Crown-Zellerbach Co., pf.	87	85½	86¾
Flintkote Co.	13⅜	12¼	13¼
Robert Gair	1⅝	1½	1⅝
Robert Gair, pf.	9⅞	9	9⅞
International Paper & Power	15½	14	14⅞
International Paper & Power, pf.	73⅞	69⅝	72½
Johns-Manville Corp.	59½	57½	59
Johns-Manville Corp., pf.	125¼	125¼	125¼
Kimberly-Clark Corp.	27	25½	27
MacAndrews & Forbes	26	26	26
MacAndrews & Forbes, pf.	....	....	....
Masonite Corp.	21¼	20	21¼
Mead Corp.	8¼	7½	8¼
Mead Corp., pf.	65¾	65¾	65¾
Paraffine Companies, Inc.	28¼	27½	28¼
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	13¾	12	13⅝
Rayonier, Inc., pf.	25⅛	24	25⅛
Ruberoid Co.	16⅞	16⅛	16⅞
Scott Paper Co.	34½	34	34
Scott Paper Co., pf.	111	109½	111
Sutherland Paper Co.	18⅝	18⅝	18⅝
Union Bag & Paper Corp.	11⅜	10½	11¼
United Paperboard Co.	3¼	3⅛	3¼
U. S. Gypsum Co.	59	57	59
U. S. Gypsum Co., pf.	175	175	175

New York Curb Exchange

High, Low and Last for Week Ending June 11, 1941

	High	Low	Last
American Box Board Co.	4½	4⅜	4½
Brown Co., pf.	18¼	15	17¾
Great Northern Paper Co.	37	37	37
Hummel-Ross Fibre Corp.	5⅞	5½	5¾
National Container Corp.	11⅛	10¾	11⅛
St. Regis Paper Co.	2	1¾	2
St. Regis Paper Co., pf.	93	90¼	93
Taggart Corp.	....	....	....

Brown to Reorganize Subsidiary

As an important step toward the consummation of the plan of reorganization of the Brown Company, petitions have been filed by the trustees and by the reorganization managers in the U. S. district court at Portland for hearing June 18, asking authority to vote the stock and bonds of the Canadian subsidiary, Brown Corporation, in favor of recapitalization proceedings of the Canadian company and an intercompany settlement.

Serge Semenenko, chairman of the reorganization managers, stated that in accordance with the petitions Brown Corporation's pre-reorganization claim against Brown Company of $924,720 would be settled at 15 cents on the dollar, approximately half the rate of the cash provision for other unsecured creditors under the plan. Brown Corporation's $76,012 loss of this settlement would be charged against its 1941 earnings.

Bersimis Lumber Company, timber-holding subsidiary of Brown Corporation, would be merged into the latter, resulting in a combined operating deficit for Brown Corporation of $814,223 as of Dec. 1, 1940. The stock of St. Maurice Power Corporation, 50 per cent owned power affiliate, on Brown Corporation's books, would be written down, from the estimated value placed thereon in 1931, to $1, and past timberland write-ups of $35,778 would be written off. These deficits and write-downs would be absorbed by a $3,350,000 reduction of capital stock of Brown Corporation, leaving the capital at $10,650.000.

Brown Corporation's first mortgage bonds held by Brown Company, and to be pledged to secure the new RFC loan and new general mortgage bonds of Brown Company, would be increased to $5,000,000 by funding of overdue back interest, by amendment of the existing trust deed. Remaining accrued interest to Nov. 30, 1940, of $203,759 would be paid in cash.

The many details incident to working out the terms of the RFC loan have been nearly completed, Mr. Semenenko says, and subject to approval by the reorganization managers, the mortgage indentures and other instruments are expected shortly to be ready for submission to the court for approval.

Abitibi Bondholders to Get Capital

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., June 9, 1941—Bondholders of Abitibi Power and Paper Company will receive almost immediately about one-third of the present working capital of something more than $18,000,000.

Mr. Justice Middleton, in chambers, today granted application for an order authorizing G. T. Clarkson, receiver and manager, to pay $6,274,710 of the cash of the company on account of principal, to the company's bondholders. This amount works out to $130 for every $1,000 bond.

The order provided for the payment to be made in Canadian funds and instructed Mr. Clarkson to apply to the foreign exchange control board for facilities to pay non-resident holders for amounts which Canadian funds would produce.

The application was made by Glyn Osler, K. C., and D. G. Guest, representing the bondholders' protective committee of the Abitibi company. W. N. Tilley, K. C., and Strachan Johnston, K. C., appeared on behalf of the Montreal Trust Co., trustee of the Abitibi company. E. G. MacMillan, K. C., appeared for the liquidator.

It is understood no recipient would lose his right to establish a legal case for more money later.

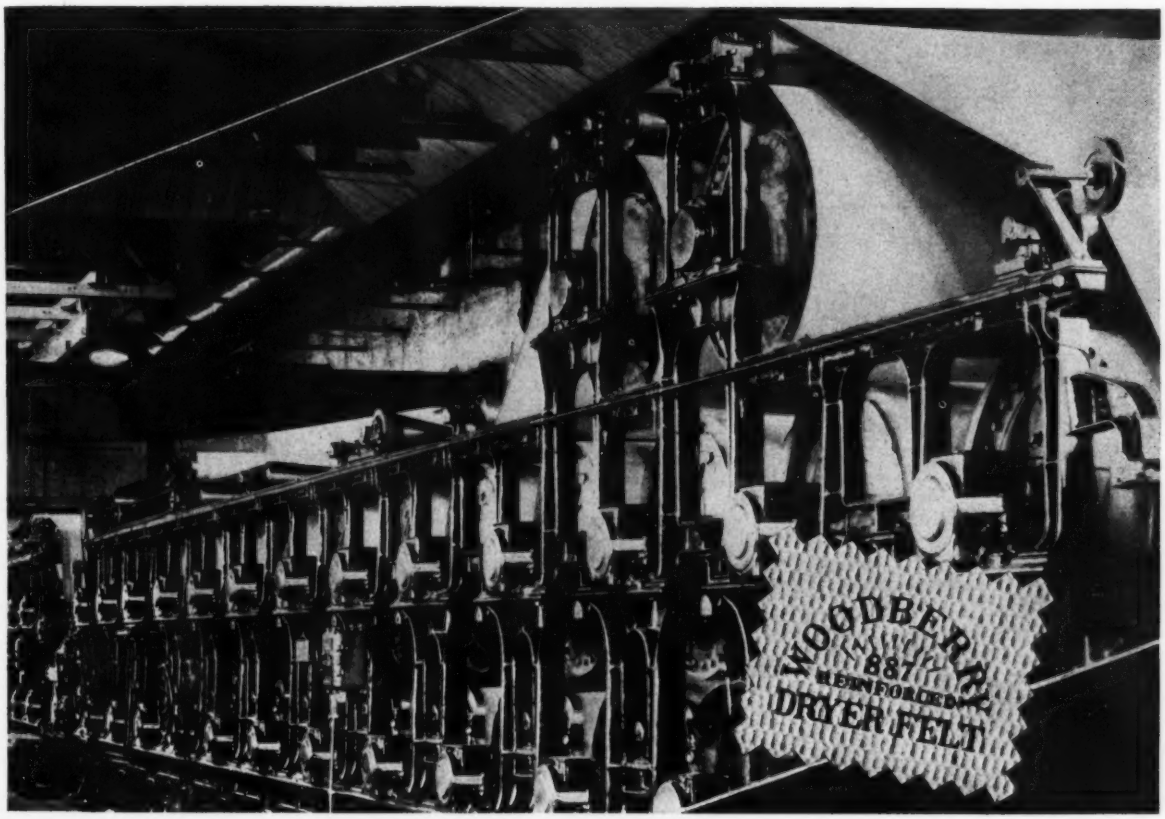
Although the order has been granted, there is much detail to be worked out before payments are made.

The meeting was held in private and lasted about an hour.

Since Abitibi company went into receivership in June, 1932, no payments have been made on account of either interest or sinking fund. In the interval, particularly in the last few years, substantial earnings have been made, available for bond interest, after depreciation allowances, and net working capital has mounted steadily and rapidly to a total of $18,828,372 at the end of 1940.

It will be recalled that the receiver and manager's reorganization plan recommended payment of interest, when net working capital was in excess of $10,000,000, and that the Royal Commission's report in its recommendations said that working capital should be maintained at $10,500,000 ($500,000 being for

Are **You** One of Those Who Has Reduced Dryer Felt Costs With **WOODBERRY 887's?**



For more than two years WOODBERRY 887's have been effecting important dryer felt economies for leading paper mills throughout the country. A patented construction with a face reinforced by asbestos yarns greatly prolongs their life and reduces dryer felt costs per ton of paper made.

Shrinkage and stretch in these precision built dryer felts is low. They require fewer adjustments and account for fewer production delays. Their rate of transpiration is high and they are often responsible for lowered steam consumption. Specify WOODBERRY 887 dryer felts for all round dryer felt efficiency and economy.

MT. VERNON WOODBERRY MILLS, INC.

TURNER HALSEY COMPANY

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40 WORTH STREET ★ NEW YORK, N. Y.

CHICAGO • NEW ORLEANS • SAN FRANCISCO • BOSTON • BALTIMORE • LOS ANGELES

improvements and additions to plant) before payment of bond interest. Payment of $6,274,710 on account of principal would leave over $12,000,000 net working capital, as at Dec. 31, 1940. This year's earnings indicate that further large additions have been made to net working capital this year to date.

Abitibi Power and Paper bonds advanced sharply today, following the action of the court in ordering a payment to the bondholders on account of principal. The free bonds rose to 68½ bid and 71½ asked and the C.O.D. bonds to 66½ bid and 69½ asked. At the previous close, the free bonds were 67½ bid and the C.O.D. bonds 63½ bid.

While the main investment interest in the bond market during the past week was focused on the increased acceleration of subscriptions for the Victory Loan 1941, paper bonds scored the highest gains of the week. Consolidated Paper 5½s '61 advanced 2½ points 69¼-70; Abitibi 5s '53 at 69 bid; Brown 5½s '46 at 53½, and M. and O. Paper at 74-76, each registering one point gains, with offerings lighter than bids.

I. P. Declares Big Dividend

The Board of Directors of International Paper and Power Company on Tuesday of this week declared a regular dividend of $1.25 a share for the second quarter of 1941 and also a dividend of $5.00 a share on account of accumulated unpaid dividends accrued on the Company's outstanding cumulative convertible 5% preferred stock, both payable June 28, 1941, to holders of record at the close of business June 20, 1941. This payment will reduce the amount of accumulated unpaid dividends to $5.00 a share.

The board of directors of the International Paper Company which also met Tuesday declared a dividend of $6.25 a share on the company's outstanding cumulative 7% preferred stock payable June 28, 1941, to holders of record at the close of business June 20, 1941.

Gaylord Container Reports to SEC

The Gaylord Container Corporation reported to the SEC that last month it borrowed $1,000,000 from a group of five banks, issuing five promissory notes bearing interest at 2½ per cent to evidence the loans. The borrowings were made against a credit agreement dated October 28, 1940, under which the five banks agreed to loan the company not to exceed $5,000,000 to be used to finance plant expansion.

West Virginia Nets $2,206,429

The West Virginia Pulp and Paper Company and subsidiaries for the six months to April 30 reports a net profit of $2,206,429, against $1,366,844 comparatively in 1940.

Fir-Tex Earns $1,529

The Fir-Tex Insulating Board Company for 1940 reports a net income of $1,529, contrasted with net loss in 1939 of $68,038.

Celotex Reports $235,000

The Celotex Corporation for April reports a net profit of $235,000, compared with $126,000 in April, 1940.

I. P. To Hold Meeting June 25

The International Paper and Power Company will hold its annual meeting at the principal office of the company, 45 Milk street, Boston, Mass., Wednesday, June 25, for the election of a full board of directors and for the transaction of any other business which may properly come before the meeting.

The nominees of the management of the company for election as directors are as follows:—Gordon Auchincloss, Malcolm G. Chace, H. A. Colgate, Richard J. Cullen, J. H. Friend, John H. Hinman, W. N. Hurlbut, David T. Layman, Jr., Charles S. McCain, Ogden Phipps, H. G. Place, B. A. Tompkins, H. R. Weaver, A. H. Wiggin and W. G. Woolfolk.

During the year 1940 the company and its subsidiaries paid an aggregate remuneration of $328,666.29 to the directors and officers of the company, considered as a group. This amount includes $97,674.90 paid to Richard J. Cullen, president and director, $50,625.03 paid to John H. Hinman, a vice-president and director and $39,577.02 paid to H. R. Weaver, a vice-president and the treasurer and a director.

Flameproofing of Paper

Flameproofing of paper, textiles, wood and other porous and fibrous materials can easily be obtained by the use of flameproofing agent 361, a new type of flameproofing material. This product is an odorless, water-white liquid, and it is non-toxic. It mixes readily with cold water in all proportions.

Flameproofing agent 361 is particularly recommended for flameproofing of paper, cotton goods, etc., where the elimination of afterglow is an important factor.

Among other interesting features is the fact that it does not dust off. It is non-hygroscopic, so that materials treated with it do not become damp or sticky in humid weather, nor harsh and brittle in dry weather. Tests made with this product, on a number of different kinds of paper and textile materials, showed that flameproofing agent 361 causes no reduction of tensile strength.

In general, about 20% of flameproofing agent 361 can be used with 80% water, dipping the goods into the cold solution for a few minutes, then wringing and drying in the usual way. The solution can also be sprayed, if that method of treatment is desired.

Samples and prices can be obtained from the manufacturers, the Glyco Products Company, Inc., 230 King street, Brooklyn, N. Y.

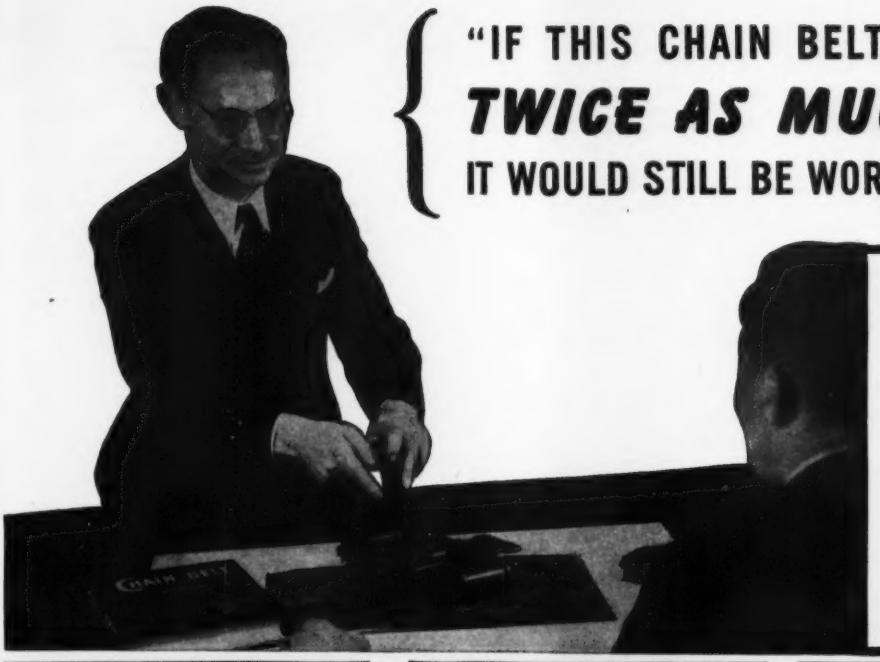
West Virginia To Pay 50 Cents

The West Virginia Pulp and Paper Company declared a payment of 50 cents a share on the common stock, payable July 1 to stockholders of record June 20. This is the first disbursement since a dividend of 40 cents was paid on April 1.

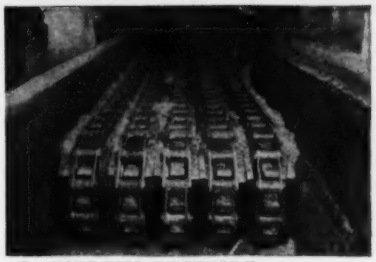
Soundview Reports for Five Months

The Soundview Pulp Company reports as follows for the five months to May 31: Net income, $815,362, or $1.56 a common share, against $954,977, or $1.84 a share, for last year's period.

"IF THIS CHAIN BELT COST *TWICE AS MUCH*— IT WOULD STILL BE WORTH IT," I TOLD HIM



HE AGREED... AFTER HE TRIED Z-METAL CHAIN BELT!



① **"TAKE THIS CONVEYOR,"** I said. "You said you've had a lot of trouble with it this season. Actually, you've had much maintenance and 'pampering' that you could eliminate if you would install Z-Metal chain belt.

② **"YES, BUT Z-METAL CHAIN BELTS** cost more," he said. "Sure they do," I agreed, "but look what you're getting—over 25% greater strength than malleable, far more resistance to abrasion and corrosion.

③ **"THIS DUROBAR CHAIN BELT** made in Rex Z-Metal will wear far less than ordinary chain belt. Z-Metal's high Brinell hardness makes this chain belt second to none for service under exposed conditions.

④ **"AND REMEMBER, Z-METAL** chain belts are available in the same patterns as malleable chain belts. New sprockets are not necessary. You can make the change-over with minimum delay—even over the week-end if you have to.

⑤ **"Z-METAL ON YOUR CONVEYORS,** and Rex roller chain belts like these on your drives, are the best insurance I've ever heard of for uninterrupted production schedules. Better investigate these roller chain belts, too!

⑥ **"IT SOUNDED TOO GOOD,"** he told me a few months later. "But Rex Durobar Z-Metal chain belts were just what I needed on that conveyor, and your roller chain belt drives are the smoothest operating I've ever seen."

P.S. *If your malleable chain belts are not giving the service you'd like, if steel chain belts are too expensive, investigate Rex Z-Metal today. Write for folder "How To Cut Plant Operating Costs." Also ask about Rex roller chain belts mentioned in this imaginary conversation. Address, Chain Belt Company, 1605 W. Bruce St., Milwaukee, Wisconsin.*

REX CHAIN BELTS

CHAIN BELT COMPANY OF MILWAUKEE

Baldwin-Duckworth Chain Belt Division, Springfield, Massachusetts • Worcester, Massachusetts
Rex Chain Belt and Conveyor Divisions, Milwaukee, Wisconsin

50TH ANNIVERSARY 1891 REX 1941 CHAIN BELT COMPANY

CONSTRUCTION NEWS

Chicago, Ill. — The Dearborn Paper Products Company, 1440 West 21st place, manufacturer of corrugated paper boxes and containers, has taken out a building permit for new addition, to be two-story, about 38 x 71 feet, estimated to cost about $35,000. It will be used for general operations and expansion. General contract has been let to Mezek & Nelson, 30 West Seventy-fifth street, and work will be placed under way at once.

Stevens Point, Wis. — The Whiting-Plover Paper Company, manufacturer of writing and other paper stocks, has awarded general contract to C. R. Meyer & Sons Company, 50 State street, Oshkosh, Wis., for proposed addition to steam power house at mill, previously referred to in these columns. It will be 32 x 52 feet, and equivalent to three-story in height, and is reported to cost over $75,000, including equipment. A new boiler unit and accessories will be installed, providing for considerable increase in present output. Helmick, Edeskuty & Lutz, Essex Building, Minneapolis, Minn., are consulting engineers.

Brooklyn, N. Y. — The Gummed Tape and Devices Company, 67 34th Street, manufacturer of gummed paper tapes and allied products, has leased a two-story industrial building on local site at 1318-20 60th street, and will occupy for expansion. Present works will be removed to new location.

Bogalusa, La. — The Gaylord Container Corporation, 2820 South 11th street, St. Louis, Mo., has recently concluded arrangements for financing in amount of $1,000,000, to be used for expansion and improvements in sulphate pulp and paper mill at Bogalusa, operated by the Pulp and Paper Division of company. Work on project is now under way, as previously noted in these columns, and will provide for installation of machinery and equipment for considerable increase in present capacity. The digester department is being enlarged; a new unit will be installed for bleaching sulphate pulp. In the paper-manufacturing division, a new Fourdrinier machine will be installed and auxiliary equipment, to produce kraft paper stock 196 inches wide on basis of about 1500 feet per minute. A new cylinder machine, also, will be installed for other paper stocks, as well as additional equipment in finishing department. A new addition is in progress for expansion in paper-converting division for production of paper bags of various kinds. The complete program will represent a reported investment of approximately $6,000,000.

Tacoma, Wash.—The St. Regis Kraft Company, an interest of St. Regis Paper Company, 230 Park avenue, New York, N. Y., has taken out a permit for new one-story addition to mill on Canal street, Tacoma, to be equipped as a recovery unit. It is estimated to cost over $75,000, with machinery. Contract for erection has been awarded to Howard S. Wright Company, Seattle, Wash., and work will proceed at once. This is part of an expansion and improvement program at the local sulphate pulp mills of company, begun a number of weeks ago, as reported in these columns at that time, with entire project to represent cost of about $500,000, including machinery. The Industrial Engineers & Contractors, Inc., 711 Middle Waterway, Tacoma, has contract for different features of work.

Syracuse, N. Y.—Fire recently damaged part of storage and distributing building of the Market Paper Company, 2067 Park street, commercial paper products. An official estimate of loss has not been announced, but is reported as slight.

Chester, Pa.—The Scott Paper Company, manufacturer of tissue paper products, has approved plans for new addition to mill, consisting of a steel frame building, reported to cost over $85,000, including equipment. General contract for erection has been awarded to David M. Hunt, Chester, and work will be placed under way at early date.

Newark, N. J.—The Baldwin Carbon Company, Inc., a new concern in the city to manufacture carbon papers and allied products, has leased a floor in local industrial building at 317 Halsey street, and will occupy for plant.

Los Angeles, Calif.—The California Container Corporation, 711 East Gage avenue, Vernon, Los Angeles, manufacturer of corrugated paper boxes and containers, has begun erection of new plant unit at Boyle avenue and Fiftieth street, previously referred to in these columns, consisting of a one-story structure, 279 x 313 feet. It will be used for general production, storage and distribution, and is reported to cost over $100,000, with equipment. The Austin Company of California, Inc., 777 East Washington boulevard, Los Angeles, is engineer and contractor.

Kaukauna, Wis. — The Thilmany Pulp and Paper Company, manufacturer of tissue, greaseproof and other processed paper stocks, has let contract to Frank Huss, Kaukauna, for excavations for proposed new addition to mill, and foundations for structure are now being completed; superstructure will begin soon. New structure will be one-story, 52 x 180 feet, and will be used for coating division with installation to include a 120-inch asphalt coating and combining machine, and accessory equipment. Cost is estimated at close to $80,000, with machinery. The Permanent Construction Company, 2712 North Holton street, Milwaukee, Wis., has general erection contract.

Philadelphia, Pa.—The Barrett Company, Stiles and Margaret streets, and Frankford Creek, Philadelphia, manufacturer of roofing products, prepared roofing, etc., has concluded arrangements for purchase of a tract of adjoining property, totaling about six acres, at Stiles and Wakeling streets, and will use for expansion. Plans are under way for large addition to plant, for which work is scheduled to begin soon.

Buffalo, N. Y. — The National Gypsum Company, 190 Delaware avenue, manufacturer of wall board, insulating board and allied products, has leased a new multi-story building to be erected at 325 Delaware avenue by the Buffalo Savings Bank, for general offices. New structures will cost about $400,000 and has been secured for a period of 20 years. General erection contract has been let to George W. Walker, Inc., 770 Elmwood avenue, and work will

begin at once. Backus, Crane & Love, 360 Delaware avenue, are architects.

Mille Roches, Ont. — Provincial Paper, Ltd., 388-96 University avenue, Toronto, Ont., manufacturer of book, catalog, envelope and other paper stocks, plans one-story addition to branch mill at Mille Roche, reported to cost over $75,000, with equipment.

New Companies

New York, N. Y.—The Hygrade Paper Company, Inc., has been incorporated with capital of 100 shares of stock, no par value, to deal in paper products of various kinds. New company is represented by Barnard Blum, 152 West Forty-second street, New York, attorney.

New York, N. Y.—The Southern Kraft Paper Corporation has been chartered under state laws with capital of $1,000,000, to manufacture kraft paper stocks. It is understood that the International Paper Company, 220 East Forty-second street, and its affiliate, Southern Kraft Corporation, same address, are interested in the new company, which is represented by Prentice Hall, Inc., 90 Broad street, New York.

Wilmington, Del.—Package and Container Corporation has been chartered under Delaware laws with capital of 1000 shares of stock, no par value, to manufacture corrugated paper boxes and containers of various kinds. New company is represented by the United States Corporation Company, Dover, Del. The incorporators include J. M. Townsend and M. S. Cook.

Paper Box Men Meet at Atlantic City

ATLANTIC CITY, N. J., June 9, 1941—An increased shortage of essential materials for the manufacture of paper boxes due to the defense program was the principal topic of discussion before the twenty-third annual convention of the National Paper Box Manufacturers Association, which opened here yesterday.

Five hundred setup box manufacturers, employing 38,000 and having an annual output of $100,000,000 are attending the sessions, which continue through Wednesday.

An association spokesman said, after a preliminary meeting, that supplies of board, paper, glue and other essentials in the industry are four to six weeks behind schedule in deliveries and that the situation is growing worse. Recommendations designed to alleviate the conditions are expected to be considered by the delegates.

Mrs. Muriel F. Merritt Awarded Degree

Word has been received that Mrs. Muriel F. Merritt, one of the originators of the Lofton and Merritt stain to differentiate between unbleached sulphite and sulphate pulps, has just been awarded the degree of Bachelor of Education at the University of California, Los Angeles, Cal. Mrs. Merritt was formerly a member of the Paper Section Staff of the Bureau of Standards in Washington, D. C., where the Lofton-Merritt stain was developed.

Mrs. Merritt has devoted much of her time during recent years to painting and will spend the next year at Juneau, Alaska, where she will have an opportunity to carry on her art work.

Obituary

Harry J. Adrian

[FROM OUR REGULAR CORRESPONDENT]

STEVENS POINT, Wis., June 9, 1941—Harry J. Adrian, manager of the Consolidated Water Power and Paper Company's mill here, died Thursday morning, June 5, at St. Michael's hospital. He had been in ill health for the last four years, during which he was hospitalized several times at Stevens Point and at Rochester, Minn.

Mr. Adrian was born at Little Chute, Wis., June 26, 1896, and therefore was 44 years of age. He spent most of his early life at Appleton, Wis., and after completing his schooling was employed by the Thilmany Pulp and Paper Company at its former mill at Appleton, and later by the Kimberly-Clark Corporation at Niagara Falls, N. Y. He moved to Stevens Point nine years ago to take employment with the Consolidated company and became its mill manager six years ago. His marriage to Miss Kathryn Briggs of Appleton, took place March 28, 1921 at Niagara Falls.

During the last world conflict, Mr. Adrian was stationed at Fort Benjamin Harrison, Indianapolis, Ind., as an instructor in the motor vehicle department. He was a member of The American Legion, and a past commander of Romulus Carl Berens Post No. 6 at Stevens Point. He was president of the Holy Name Society of St. Stephen's Catholic church at the time of his death, and also served as a trustee of the Knights of Columbus.

Survivors are the widow, a daughter, Mary Kathryn, and a son, John.

Funeral services were held Saturday morning at St. Stephens church and the body was conveyed to Appleton for burial in St. Mary's Catholic cemetery. The American Legion ritual was conducted at the grave by the Appleton Post, and military rites were conferred.

William J. Redmond

William J. Redmond, 71, of 514 Phelps avenue, lifelong resident of Kalamazoo, Mich., and employee of the Kalamazoo Paper Company 55 years before his retirement two years ago, died suddenly early this month at the home of his son, Arthur W. Redmond, 330 North Westnedge avenue.

Death was due to a cerebral hemorrhage.

Mr. Redmond, who was superintendent of Mill 4 about 30 years, retired April 1, 1939. He had been in fair health.

He was born in Kalamazoo Jan. 17, 1870, and was a captain of the United States army in the Spanish-American war. He was captain of the local "Light Guards," a former Spanish-American war veterans' organization, 15 years, and belonged to the Last Man's club.

He was a member of the St. Augustine church, of the Holy Name society, was president of St. Vincent DePaul society, and belonged to the Knights of Columbus and Elk lodges.

Surviving besides the widow and son are two other sons, Robert and Stanley of Detroit; four grandchildren and four brothers.

PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Henry J. Berger
EDITOR

Vol. 112 June 12, 1941 No. 24

COMING EVENTS IN PAPER INDUSTRY

New England Section. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

Delaware Valley Section. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

Lake States Section. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

Kalamazoo Valley Section. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

American Pulp and Paper Mill Superintendents Association. Twenty-second Annual Convention, Poland Spring House, Poland Spring, Me., June 17-19.

Technical Association of the Pulp and Paper Industry, Fall Meeting, Ann Arbor, Mich., September 16-19.

BUSINESS CURTAILMENT

It is the expectation of those who are in a position to speak with authority, that the conflict in Europe and our economic position in relation to it, will be more clearly understood by the country at large in the near future. Many manufacturers and general business men and all consumers will soon enough experience the changed and changing national economy. Defense goods and materials for their production will be largely withdrawn from civilian use. This priority of materials must necessarily cause a substantial change from normal conditions. The importance of this transition to an all-out defense effort will necessitate the curtailment of the output of many industrial plants and the closing of others. Employees in these non-essential productive enterprises will have to shift to other plants. This, in turn, will force many merchants distributing goods manufactured in whole or in considerable part of essential defense materials to substitute other lines of goods, as it becomes increasingly difficult to replenish normal stocks. Thus, consumers will be limited to the selection of goods they can purchase and "business as usual" will come to an end as the total resources of the country are utilized more and more for defense objectives.

This prospect must be viewed with the seriousness it deserves but it should not create fear. The country has been forewarned of just such a change and must be prepared to face the realities of a less comfortable mode of life. The proclamation of President Roosevelt that an unlimited emergency exists, is a brief warning that a period of sacrifice is about to begin, that industry must meet and solve as best it can many difficult problems and that more drastic and extension of control will be exercised by the government.

From current reports it seems clear that industry in the United States will soon experience a shortage in many metals and that as the production of defense goods expands, such supplies will be more and more inadequate to supply the needs of both defense and civilian uses. Rationing of supplies must, therefore, be expected to occur in order to conserve materials for defense requirements and some large factories and many small private enterprises may be forced to shut down through lack of materials. Unfortunately, a substantial curtailment in some non-defense products, such as private automobiles to mention but one example, would mean that thousands of manufacturers of parts, workmen, dealers and salesmen would be obliged to shift to other work. Many industries would be affected in a similar manner and this shift from non-defense goods to defense goods will undoubtedly be found to be of such large proportions that it will very seriously affect normal industrial operations.

Another phase of this all-out effort is that of paying for rearmament. The drastic increases in Federal tax rates proposed by the Treasury Department have confronted the American people with the first definite indication of the scope of the sacrifices that must be made in meeting the cost of national defense, states the Guaranty Trust Company of New York in discussing paying for rearmament in the current issue of *The Guaranty Survey*. "Although some specific features of the Treasury's plan have been criticized, no voice has been raised against its main objective," *The Survey* continues. "This ready acceptance of a prospective financial burden of such magnitude is a reflection of the people's determination to face the realities of the task that lies before them and their recognition of the economic problems that the vast project necessarily involves."

In pointing to the need of economy in non-defense spending, *The Survey* states in part that, "The most disappointing feature of the tax discussion of recent weeks is its failure to reveal any clear outlook for material reductions in non-defense spending. Demands for such reductions have been made in and out of Congress. Secretary Morgenthau told the Ways and Means committee last month that the Government continues to spend in non-defense and non-relief fields 'as if we had no emergency defense program, as if we could superimpose our huge rearmament effort upon government as usual and business as usual . . . It would be folly to assume that we can continue to spend now as we did in normal times.' A somewhat similar attitude on the part of the President has been indicated from time to time by press reports. Yet no definite step toward a substantial reduction in non-defense costs has been taken. On the contrary, the Senate has recently passed the largest agricultural appropriation bill in

history, and both branches of Congress have approved mandatory crop loans at 85% of parity prices, despite the fact that farm income increased last year and is expected to increase again this year."

Continuing the comment states, "That an increase of three and one-half billion dollars a year in Federal taxes, including an additional direct levy on business amounting to more than a billion, will present a staggering financial burden, is too obvious to require emphasis. Nevertheless, the prospect that two-thirds of next year's huge defense expenditures may be met from current revenue and that a determined effort will be made to raise as large a share as possible of the remaining third by the sale of Government obligations to individual and corporate investors, rather than to the banks, is reassuring to those who recognize the grave perils inherent in the usual methods of emergency finance. The outlook would be even more encouraging, however, if the tax plan were accompanied by signs of substantial retrenchment in non-military expenditure."

CIO To Be Consolidated Agent

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 11, 1941—The National Labor Relations Board has announced certification of Local Industrial Union, Local No. 1001 (CIO), as sole bargaining agent of production, maintenance and powerhouse employees at Plant No. 1 of Consolidated Paper Company, Monroe, Mich.

Certification was based on a secret ballot election in which the union received 95 votes against 50 opposing.

Germany To Use More Poplar for Pulp

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 9, 1941—Production of cellulose in Germany from wood is to be increased by cultivating quick-growing poplar trees and other more productive species of pine, birch, and ash, according to press reports. The aim of the "Four Year Plan" to increase consumption of beech wood for chemical pulp manufacture to 2,500,000 cubic meters has been realized despite the war. Consumption of beech timber, which amounted to 500,000 cubic meters during 1937-38, is estimated at 2,400,000 meters during the current economic year. Consumption of pine timber during the same period rose from 1,300,000 cubic meters to an estimated 1,900,000 cubic meters.

Although during the past four years consumption of wood for cellulose manufacture has more than doubled, it has not been sufficient to fill the demand of the paper and rayon industries. Recourse was made, therefore, to increased utilization of straw and waste paper. (Production of cellulose increased, thus, from 52,000 metric tons in 1936 to 77,000 tons in 1939.) Consumption of domestic waste paper increased from 700,000 tons in 1936 to 990,000 tons in 1939. The quantity of artificial fiber cellulose manufactured in the latter year amounted to 248,000 metric tons, compared with 89,000 tons produced in 1936. The 1940 production is estimated at 300,000 metric tons.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks, 1941		Corresponding Weeks, 1940	
April 26	98.1	April 27	89.4
May 3	100.1	May 4	89.3
May 10	100.9	May 11	88.6
May 17	98.8	May 18	91.7
May 24	100.8	May 25	92.7
May 31 (Prelim.)	*97.7*	June 1	87.6

(7 day operations prevalent)

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1940	89.1	84.7	82.3	84.3	90.0	92.1	85.3
1941	85.1	89.4	92.3	96.6	*99.5*	...	...

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1940	85.1	81.5	85.5	84.9	80.9	85.6
1941	...	...	...	...	...	...

COMPARATIVE YEARLY SUMMARIES

	1935	1936	1937	1938	1939	1940	1941
Year to Date	68.4	78.1	89.3	67.6	79.8	86.4	*92.4*
Year Average	69.9	80.4	79.8	71.5	83.4	85.6	...

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS †

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1936	62	67	67	70	69	70	69	75	78	82	80	74	72
1937	80	86	86	88	85	77	66	74	69	65	55	45	73
1938	54	60	61	57	58	56	57	66	66	70	65	59	61
1939	60	67	71	69	64	67	63	72	74	84	81	71	70
1940	71	70	69	70	76	79	72	74	72	79	77	71	73
1941	75	81	82	83	*84*	..	..	..	..	..	..	..	..

Week ending Apr. 26, 1941—84
Week ending May 3, 1941—83
Week ending May 10, 1941—84
Week ending May 17, 1941—84
Week ending May 24, 1941—85
Week ending May 31, 1941—*84*

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

Paper Industry Future Bright

TORONTO, Ont., June 9, 1941—The high level of industrial activity and the improvement in national purchasing power are greatly stimulating demand for virtually all lines of paper and paper products, and the industry is assured of a high operating rate for the remainder of this year at least. Tonnage volume is expected to run five to 10% higher than in 1940, with dollar sales showing a somewhat larger gain as a result of higher average prices. Generally speaking, the companies producing paperboard, wrapping paper, and paper bags appear likely to report the best gains in sales volume. These lines will benefit not alone from rising consumer spending, but also from demand for packaging a myriad of small items being manufactured for war purposes, boxes for small arms ammunition alone being an item of some consequence.

Heads Savannah Paper Festival

SAVANNAH, Ga., June 9, 1941—Ravenel H. Gignilliat was re-elected president of the Savannah Paper Festival, Inc., last week at the annual meeting of the association held at the Hotel Savannah. Other officers named were:

J. E. Averett, first vice-president; A. A. Lawrence, second vice-president; J. A. Mendel, third vice-president; C. J. Musante, comptroller; E. A. Perkins, treasurer; Walter Brown, secretary; and the following members of the executive committee:

Hugh Hill, Jack Cay, Mark Sheridan, Sidney Levy, F. A. Leutwyler, J. P. Houlihan, Jr., and J. H. Harrison. Members of the nominating committee which presented the new slate of officers for next year's festival were A. K. Dearing, chairman; A. A. Clark, and Varnedoe Hancock.

Modern sizing methods and materials for improved water resistant qualities in paper and paper boards

NATURE OF SIZING. Microscopic studies show that sizing is accomplished by the deposition of fine particles of rosin on the surfaces of fibres and the degree of water resistance depends on the number of particles and the evenness of their distribution. Both experimental and commercial experience also proves that the effectiveness of a size depends on its degree of water repellence which is indicated by measurement of the angle of contact made by a drop of water with the active raw material in the size. The superiority of paraffin wax (contact angle 110°) over rosin (contact angle 66°) in this respect has long been known, but its introduction into paper was delayed by the difficulty in preparing the wax so that it could be deposited on the fibres evenly and in fine particles.

DEVELOPMENT OF WAX EMULSIONS. For years Cyanamid research chemists and field technicians have been working on the problem of developing the best emulsifying methods, evaluating various raw materials and working out the best methods of procedure in the paper mill to secure these four cardinal virtues: fine particles, good retention, even distribution and high water repellence. As a result, Cyanamid has developed a group of products which is giving superior water resistant qualities to a wide variety of paper and paper board products, with safe paper machine operation, even facilitating production in some cases.

PAPER MILL SIZING PROCEDURES. Water resistance is best secured by the addition of both rosin and wax in the course of stuff preparation although this may be supplemented by a surface application of a wax emulsion which serves to improve the smoothness of the paper as well as its water resistance. Combining the proper proportions of rosin and wax and choosing the best type of emulsification for both calls for consideration of many factors if the required degree of sizing is to be obtained and if, at the same time, the other essential characteristics of the sheet are to be preserved. These factors include character of supply water, type of fibres, use requirements of the finished product, and the like. Experienced Cyanamid men both in the field and in the laboratory are interested in your problems and will be glad to assist you in choosing the best methods and materials for attaining maximum water resistance of your products.

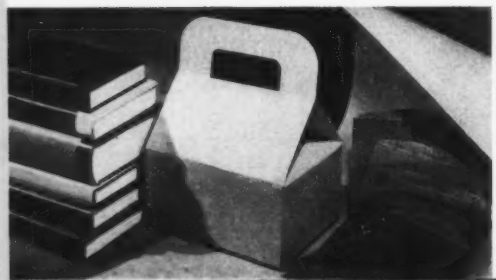
In addition to many new specialties for the paper field, Cyanamid supplies:
WAX SIZES • COATING MATERIALS
ROSIN SIZES • SYNTHETIC RESINS
CASEIN • ALUM • TAPIOCA FLOUR
SULPHONATED OILS • FILLERS
DEFOAMERS
AEROSOL* WETTING AGENTS and
OTHER PAPER CHEMICALS
*Trademark of American Cyanamid & Chemical Corporation applied to wetting agents of its own manufacture.

American Cyanamid & Chemical Corporation

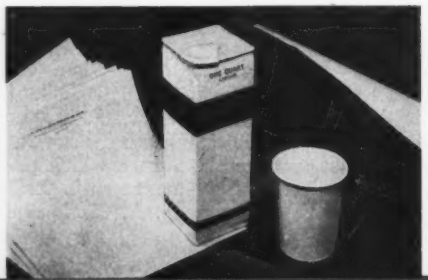
A Unit of American Cyanamid Company

30 ROCKEFELLER PLAZA • NEW YORK, N. Y.

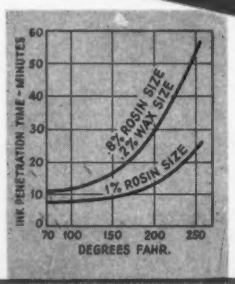
DISTRICT OFFICES: 89 Broad Street, Boston, Mass.; 600 South Delaware Avenue, Philadelphia, Pa.; Russell & Bayard Streets, Baltimore, Maryland; 3333 Wilkinson Boulevard, Charlotte, N. C.; 860 Leader Building, Cleveland, Ohio; 20 North Wacker Drive, Chicago, Ill.; Miller Road, Kalamazoo, Michigan; 931 Fisher Building, Detroit, Michigan; 900 Shell Building, St. Louis, Missouri; Azusa, California

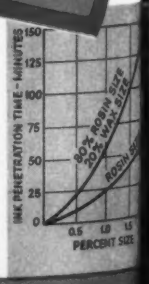


Water resistance is required in a majority of papers and paper boards mainly because of the possibility of *accidental contact* with water such as book papers, box boards, bag papers, cover stock, insulating boards, etc.



Other papers are specifically manufactured for contact with aqueous liquids such as writing papers, milk bottle boards and caps, fibre can stock, drinking cup, hanging label, blueprint, butcher, lithograph and offset paper.





Sizing tests of papers sized with rosin and papers sized with a combination of rosin and wax, under varying drying temperatures in one case and per cent size in the other. Curve shows increased sizing obtained by use of wax size.

Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Douglas Fir as a Pulpwood

Modified Sulphate Pulping Process for Chemical Pulp

By L. C. Haffner[1] and Kenneth A. Kobe[1]

In a recent paper *(3)* Haffner and Kobe have pointed out the vast quantities of Douglas fir available in the Pacific Northwest and how pulping fits in with logging and lumbering to utilize the maximum amount of wood. The sulphate process offers a number of advantages in pulping resinous woods and deserves further investigation on Douglas fir.

Little work has been reported on the pulping of Douglas fir by the sulphate process. Wells and Rue *(4)* reported that Douglas fir reduced readily by the sulphate process in yields of 45 to 50 per cent to give fairly strong unbleached pulp which could be used for wrapping paper and fiber board where high strength is not required. Haring, Hauff and Beuschlein *(2)* studied the effect of the sodium sulphide-sodium hydroxide ratio upon kraft pulp made from Douglas fir. They obtained yields of 42 to 46 per cent. They found that burst values increased with sulphidity. This effect of sulphidity has been studied further by Bray, Martin and Schwartz *(1)* who report yields of 45 per cent of pulp of alpha-cellulose content approximately 82 per cent.

It is known that sulphate mills operating in the Pacific Northwest add about 15 per cent of Douglas fir to their western hemlock to increase the resin content, and thus enhance the combustibility of the black liquor. The color of Douglas fir pulps produced by the standard sulphate method is dark and requires considerable bleaching. The strength of the pulp is reduced considerably by bleaching and even then a good white color is not obtained.

A Modified Sulphate Process

The advantage of the sulphate process is that an alkaline liquor can be compounded that is capable of dissolving bark, knots, mineral constituents, resins and waxes, and hemicelluloses. Thus a pulp high in alpha cellulose and easily purified could be produced by this method.

The sulphate process also has the additional advantages of being able to operate on most species of wood, a high rate of cooking in which the time is a quarter of that of the sulphite process. Disadvantages are that fir pulp has been hard to bleach, and that extensive facilities are required to recover the chemicals used in pulping.

The problem then is to pulp Douglas fir by the sulphate process to give a pulp of high alpha cellulose content and that can be bleached without degradation. The solution of this problem is given in the experimental section of this paper.

Experimental

As in the previous work, it was desired to make the experimental conditions conform to mill conditions. The Douglas fir chips were from those used by the Everett Pulp and Paper Company in its digesters. The western hemlock chips were those of the Soundview Pulp Company. The fir chips were smaller than the usual pulping chips and contained fragments of bark and knots that would lower the yield. The pulping liquor was produced from commercial chemicals. The cooks were carried out in 25 liter rotary digesters, electrically heated by resistance elements wound on the digester body. The charge consisted of 2000 grams of chips and 16 liters of cooking liquor. The digester was brought up to cooking temperature as rapidly as possible. At the end of the cook the pressure was relieved, the pulp dumped out on a screen and washed, then passed through a flat screen and thoroughly washed. There were never more than 2 or 3 grams of shives. The screened pulp was then pressed and dried to determine the yield.

The composition of the cooking liquor is one of the essential features of this pulping process. Numerous preliminary experiments showed that a weight ratio of $NaOH : Na_2CO_3$ of 50:30:20 gives most satisfactory results. In comparison with the usual kraft pulping liquor this liquor contains less free hydroxide and more carbonate. Analyses of the liquor for two of the runs show:

Run	E	G
Cooking Liquor		
Sp. gr. 60/60	1.150	1.142
NaOH, g. per l.	52.4	53.5
Na_2S, g. per l.	40.8	31.9
Na_2CO_3, g. per l.	18.5	19.3
Total solids, g. per l.	101.7	104.7
Black Liquor		
Sp. gr.	1.172	1.212
Total solids, %	21.6	73.6
Ash, %	18.4	22.0
Total available alkali, as Na_2O, %	7.65	10.5
B.t.u. per lb. solids	2940	

The laboratory bleaching was carried out by a hypochlorous acid bleach at pH 6.0—6.4, at high density, washed, sodium hypochlorite bleach at 10 per cent density, washed, followed by an acid chlorine bleach at 5 per cent density to give the desired whiteness, and a final washing and screening.

The data for the various runs are given in Table

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I. The data for run H are for western hemlock which was cooked under the same conditions as the Douglas fir. As the hemlock pulps more readily than the fir, the time or temperature should be reduced somewhat. For comparison, a typical analysis for a sulphite rayon pulp is given. Pulping yields are given as pounds of moisture-free pulp produced per 100 pounds of moisture-free chips.

TABLE I

Digester charge 2000 g. chips, 16 liters cooking liquor

Run	F	G	H	I	
Wood	Douglas fir	Douglas fir	Hemlock	Douglas fir	
Time to raise to temp., hr.:min.	2:45	1:15	1:00	1:10	
Time at cooking temp., hr.:min.	1:15	1:00	1:15	1:45	
Average Cooking Temp., ° F.	337	337	331	330	
Pressure, psi	113	113	104	103	
Yields					
On pulping, %	34.2	32.7	34.0	34.5	
On bleaching, %	88.8	96.4	92.8	94.9	
Overall, %	30.2	31.5	31.5	32.7	
					Sulphite rayon
Unbleached pulp					
Alpha-cellulose, %	92.08	94.18	91.81	93.88	92
KOH number	3.17	3.23	3.64	3.10	24
Cu number	0.52	0.70	0.56	0.69	2.3
$KMnO_4$ number	8.8	8.8	8.3	8.1	
Bleached pulp					
Alpha-cellulose, %	90.33	93.61	87.78	92.38	90
KOH number	6.83	6.44	8.36	7.54	19
Cu number	0.63	0.72	0.90	0.73	2

Discussion

In the manufacture of a high alpha-cellulose pulp the yields are notoriously low, being approximately 30 per cent in the usual sulphite process. This low yield, the high cost of wood preparation for sulphite pulping, and subsequent alkali purification of the sulphite pulp all contribute to increase the costs of high alpha-cellulose pulp produced by the sulphite process. If a process is one of low yields it is highly desirable that the raw materials be of lowest possible cost. Douglas fir chips produced from waste wood or low grade logs give the lowest cost wood. In the alkaline process it is possible to digest resinous materials, bark, knots and other materials that must be removed from chips to be used for the sulphite process. In addition the alkaline process gives a pulp with low KOH-number and further purification with alkali is unnecessary.

The preliminary experiments reported here do not represent the solution of this important problem. However, they do indicate the feasibility of producing a high alpha-cellulose pulp from low cost Douglas fir.

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(2) Haring, Hauff and Beuschlein, *Paper Trade J.* 90, no. 21:53-4 (1930).
(3) Haffner and Kobe, *Paper Trade J.* 111, no. 9:93-8 (1940).
(4) Wells and Rue, *U. S. Dept. Agriculture Bull.* no. 1485 (1927).

New Paper-Core Recording Blank

Many tons of aluminum have been freed for use in the National Defense Program by the success of the RCA Research Laboratories in perfecting a new 16-inch fire-resistant, paper-core recording blank for use in radio studios, airline terminals, and other locations where sound is recorded for "reference" purposes.

W. W. Early, RCA Victor Manager of Recording and Record Sales, announced the new disc, at the same time pointing to the fact that it is thinner and lighter than the aluminum-core blank, and is being sold at one-half the price of the old type.

"The new blank provides a quality of reproduction that is unsurpassed by any other paper-core blank, no matter of what size," Mr. Early said. "Many months of research preceded the perfection of the special type of paper used in the core. The result is an amazing flexibility which prevents warping and allows the disc to flatten out at the mere pressure of the cutting head."

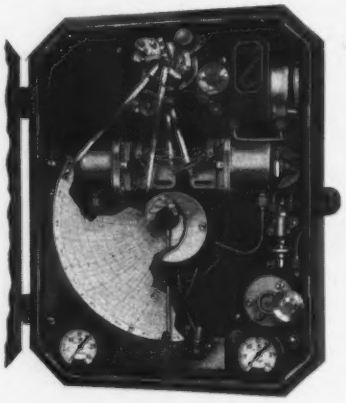
The new 16-inch blank joins the smaller sized paper-core blanks previously announced by RCA Victor, and widely used in studio and home recording.

The disc itself is slow-burning because of the paper core, and the shavings will not support combustion. With no fire hazard involved, the shavings can be thrown into any rubbish can. Its cutting surface permanency is assured, since the secret formula lacquer will not harden with age.

Many thousands of discs of this type are used for recording network radio programs and other radio transmissions of many other types. The recording may be played back immediately without processing, and is kept on file as proof of what was actually transmitted during the airing.

Direct-Set Ratio Controller

A highly adaptable, easily convertible instrument for applications where a temperature, pressure, rate of flow or liquid level must be controlled in a desired ratio or differential to another related variable is now offered by the Taylor Instrument Companies, of Rochester, N. Y. With the new direct-setting Taylor Ratio Controller the ratio is changed by a simple screwdriver adjustment directly on a calibrated dial throughout the range of 0:1 to 3:1, direct or inverse. With this new instrument it is unnecessary to disturb the processing or remove the chart plate while making ratio adjustments.



The Taylor Ratio Controller has two measuring systems one the adjusting system which indicates or records only; and the other, the controlling system, which may either indicate or record. The adjusting system resets the control point of the controlling system through a linkage arrangement according to a predetermined ratio. The action of the controlling system is the same as the 120R Series Fulscopes and may be used as a single duty bi-recording controller when the ratio setting is zero.

Both indicating and recording models of the Ratio Controller are available with all the features of the 120R Series Fulscope—Fixed High Sensitivity, Adjustable Sensitivity, Adjustable Sensitivity with Automatic Reset, Adjustable Sensitivity with Pre-Act, and Adjustable Sensitivity with Automatic Reset and Pre-Act.

The new instrument is fully described in bulletin 988158 which may be had on application.

Variation of the Order and Energy of Activation of the Delignification Reaction in Sulphite Cooking

By G. Goldfinger[1]

Abstract

There is an increasing tendency to study the reactions involved in wood pulping from the point of view of chemical kinetics. However, the newer but already classical methods which have been so fruitful in studies of the mechanism of a great number of reactions do not appear as yet to have been applied by investigators in the pulping field. The purpose of this paper is to review briefly the newer definitions of kinetics with respect to order and molecularity and to apply this knowledge to data on the sulphite pulping process obtained by Maass and collaborators (1).

Van't Hoff originated the basis for chemical kinetics in his "Etudes de Dynamique Chimique" *(2)* with the classical Equation 1:

$$v = -\frac{dA}{dt} = k A^n B^m \qquad (1)$$

where the velocity, v, of the disappearance of the chemical substance, A, is shown as a variable of the concentration of the reacting materials, $A, B, \ldots$, and the numbers $n, m, \ldots$ of molecules stoichiometrically involved. Three cases were distinguished:

(1)	$v = k\,A$	$n + m + \ldots = 1$
(2,a)	$v = k\,A\,B$	
(2,b)	$v = k\,A^n$	$n + m + \ldots = 2$
(3,a)	$v = k\,A\,B\,C$	
(3,b)	$v = k\,A^n\,B$	
(3,c)	$v = k\,A^n$	$n + m + \ldots = 3$

These cases were called without distinction (1) first order or monomolecular reaction, (2) second order or bimolecular reaction, and (3) third order or trimolecular reaction.

This simple formalism involved the assumption that the reaction can be only of the orders (1), (2), or (3). (A simultaneous collision of four molecules being very unlikely no consideration need be given to the case of a fourth order, or tetramolecular reaction.) It soon appeared, however, that many reactions, in fact, most of them, do not exactly follow the law. Furthermore it was proved that even the most simple reaction can be resolved into a number of elementary reactions having the form of Van't Hoff's equation. Therefore if the equation of Van't Hoff is deprived of its stoichiometrical significance and considered only as a mathematical expression of an experimental curve, a distinction must be made between the significance of the sum of the exponents $n + m + \ldots$ in the description of the total reaction and the exponents $n, m, \ldots$ of the elementary reactions. Consequently Tolman *(3)* and Kassel *(4)* proposed to distinguish clearly between order and molecularity as follows:

The sum of the exponents $n + m + \ldots$ of Equation 1 is called order. The order can have both whole and fractional values. Some reactions, however, have no definite order. Since by definition order becomes the exponent of the equation describing the time variation of the concentration of one of the materials involved in the reaction as a function of the concentration of all involved materials, the order is an experimental fact.

Molecularity, on the other hand, is the actual but hypothetical number of molecules involved in one step of the reaction, the elementary reaction. The molecularity can logically have only whole positive values and is always one, two, or three.

The order of a reaction furnishes important experimental information, although not sufficient for the interpretation of the mechanism of reaction. The method of Letort *(5)*, which employs Van't Hoff's

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TABLE I.—DATA ON LIGNIN REMOVAL

1-A	50° C.			70° C.			90° C.			110° C.			130° C.		
	v	n	log k	v	n	log k	v	n	log k	v	n	log k	v	n	log k
0.1	.00385	...	...	.01500	...	...	.077	...	...	.300	...	..	1.20	...	..
0.2	.00275	2.80	—2.33	.01250	2.0	—1.71	.060	1.65	—1.06	.238	1.60	—.47	1.00	3.5	+.34
0.3	.00240	...	...	.01050	...	...	.055	...	...	.200	...	..	0.72	...	..
0.4	.00155	1.88	—2.39	.00825	1.3	—1.80	.046	0.92	—1.13	.165	1.17	—.52	0.50	1.45	+.02
0.5	.00110	1.55	—2.49	.00725	1.1	—1.81	.04	0.7	—1.19	.140	0.90	—.58	0.46	0.7	—.13
0.6	.00082	0.95	—2.71	.00550	0.7	—1.98	.033	0.6	—0.24	.112	0.50	—.75	0.44	0.3	—.24
0.7	.00070	0.50	—2.89	.00455	0.53	—2.06	.029	0.51	—0.27	.105	0.23	—.86	0.41	0.19	—.29
0.8	.00062	0.45	—2.89	.00400	0.7	—1.91	.023	1.00	—0.94	.097	0.50	—.66	0.36	0.55	—.16
0.9	.00039	1.00	—2.41	.00185	1.4	—1.33	.0089	1.40	—0.65	.050	1.10	—.20	0.19	1.20	+.48
0.95	.00008	...	...	.00070	...	...	.0035	...	...	.020	...	..	0.07	...	..

TABLE II.—DATA ON NONLIGNIN REMOVAL

70° C.			90° C.			110° C.			130° C.		
Hours	A	v	*Hours*	A	v	*Hours*	A	v	*Hours*	A	v
0	1.00		0.0	1.0		0.0	1.000		0.0	1.0	
					.00392			.0737			.550
36	0.98		12.0	0.953		1.82	0.866		0.28	0.846	
					.00385			.0195			.114
72	0.99		24.0	0.911		3.82	0.827		0.78	0.789	
		.000225			.00575			.0028			.056
96	1.00		36.0	0.842		5.32	0.823		1.28	0.761	
					.00287			.0192			.064
120	0.973		48.2	0.807		7.82	0.771		1.78	0.729	
		.000542						.0155			.058
144	0.960					9.82	0.740		2.28	0.700	
		.000695									.038
180	0.935								2.78	0.681	
		.000722									
216	0.909										

classical method by differentiation, is therefore used for the determination of the orders of the pulping reaction.

With the fundamental rule of Van't Hoff, the equation of Arrhenius *(6)*, expressing the energy necessary to involve the chemical process can be

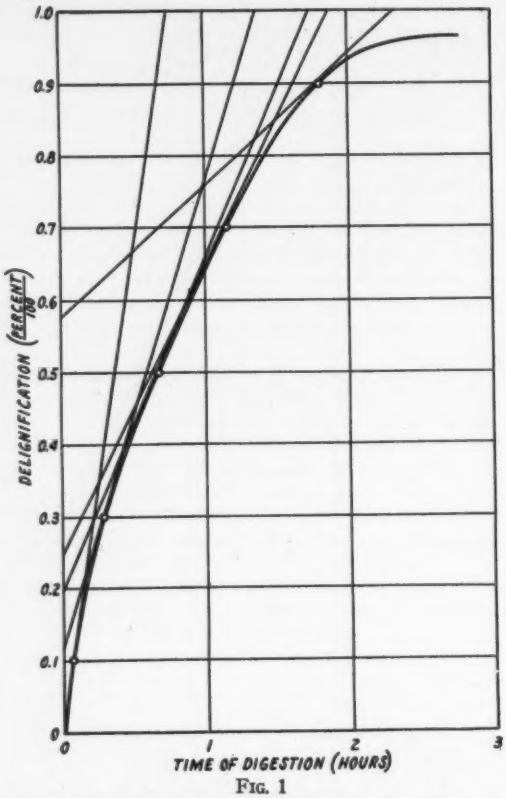

FIG. 1

Determination of the Rate of Delignification. The Slope of the Curve at the Respective Points Represents *v*; Cooking Temperature 130° C.

considered the most important equation in kinetics. This equation is as follows:

$$k = Be^{-\frac{E}{RT}} \qquad (2)$$

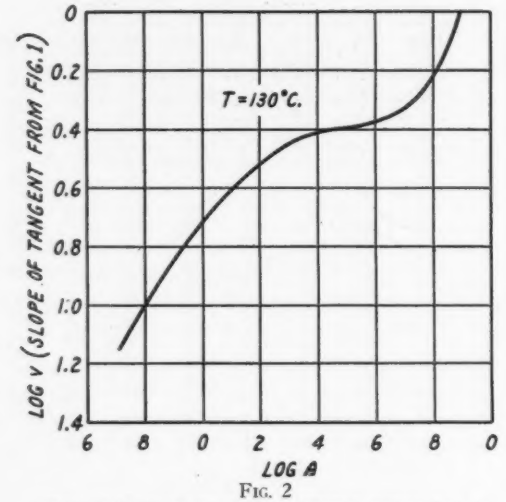

FIG. 2

Slope of Tangents from Fig. 1. Plotted against Log *A*.

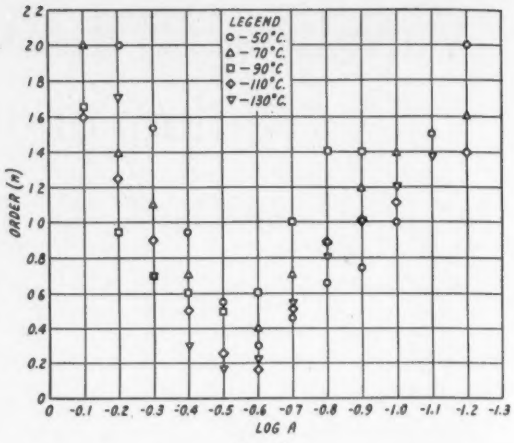

FIG. 3

The Order of Reaction as a Variable of the Degree of Delignification.

where k is the constant from Equation 1; B, a constant; e, the natural logarithmic base; E, the energy of activation; R, the gas constant; and T, the absolute temperature. In employing Equation 2 it should be recognized that the equation is merely an empirical rule based on the formal Equation 1.

Calculations

On the basis of the foregoing considerations the calculations presented in Figs. 1 to 5 and Tables I and II have been made of the order of reaction and energy of activation of both lignin and nonligninous material removed in the sulphite pulping process using the data of Maass and collaborators. The portion of material removed, 1—A, lignin in this

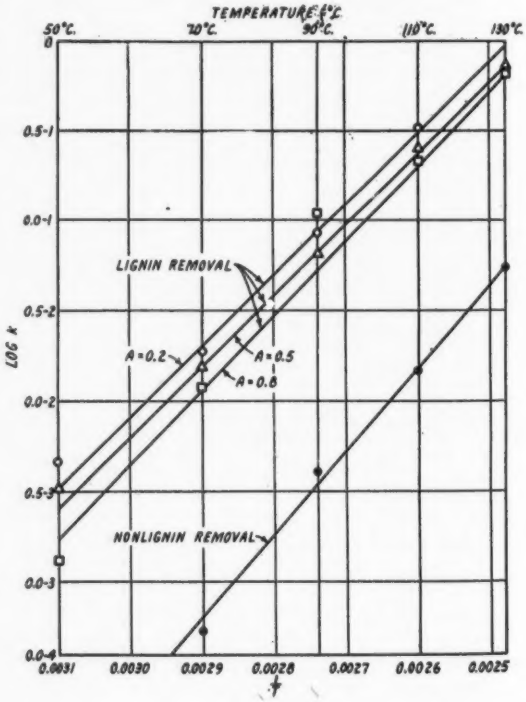

FIG. 4

Determination of the Energy of Activation. The Slope of Each Curve is Proportional to the Energy of Activation.

case, is plotted against the time of digestion (Fig. 1). From the curve obtained the tangents can be determined at regular intervals of A. The slope of each tangent is the velocity v of the reaction at the respective points. Log v plotted against log A gave the curve as shown in Fig. 2. The slopes of the tangents to this curve are the orders of the reaction; consequently the order varies throughout the reaction as shown in Fig. 3. The shape of this variation is similar at different temperatures but not identical. From Equation 1 it is now possible to calculate the value of the velocity constant k which varies throughout the entire complex reaction. Log k for the same value of A plotted against the reciprocal of the absolute temperature gave straight lines as shown in Fig. 4. The slopes of these straight lines multiplied by eR (4.57 when expressed as the energy in calories per gram molecule) gives the energy of activation E and, as shown in Fig. 5, is more or less constant until about 40% of the lignin has been removed. At that point E begins to increase and reaches a value about 50% higher than the initial value.

Applying the same consideration to the removal of the nonligninous material, the reaction appears to be of the order zero, which implies that the velocity of the reaction is independent of the concentration of the nonligninous material. Consequently there was no need to apply the graphical method in this case since k is equal to v for the reaction of the order zero. However, the energy of activation determined graphically, shown in Figs. 4 and 5, gave a value nearly as high as the highest value of the energy of activation of the lignin removal.

It thus appears that in sulphite pulping the order of the delignification reaction is high at the beginning of the reaction, decreases to nearly zero, and then increases again toward the end of the reaction whereas the order of the nonlignin removal reaction is zero (at least within the limits of the concentrations appearing in the experiments of Maass and collaborators). The energy of activation of the lignin removal is low (about 16,000 calories) at the beginning of the reaction but starts to increase when a point at about 40% delignification is reached. It finally reaches a value of about 22,000 calories. The energy of activation of the nonlignin removal is constant, being about 21,000 calories.

The order of the delignification reaction shows, what already is known, that the reaction is complex. More interpretations as to the nature of this reaction, especially an attempt to propose a mechanism, are impossible owing to the limited experimental data available. The data concerning the energy of activation, however, appear to have considerable importance, for despite the exercise of the greatest caution with regard to the numerical exactness of the data, there can be no doubt as to the general shape of the energy of activation curve for lignin removal (Fig. 5). Experiments now under way will reveal if some industrially valuable deductions are possible from these data.

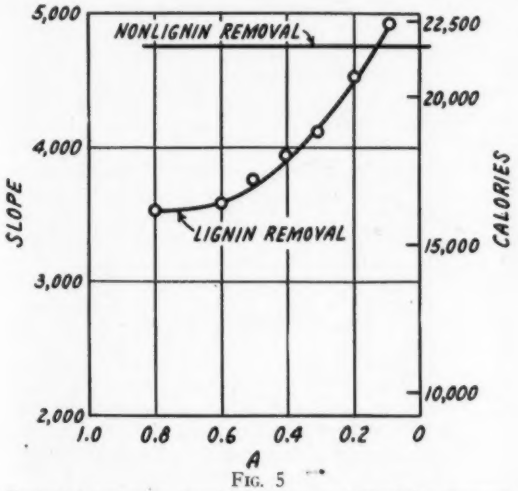

FIG. 5

Energy of Activation Curves for Lignin and Nonlignin Removal.

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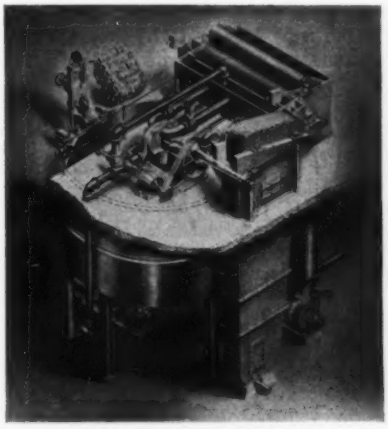
Hydrapulper System Is Compact Unit

The trend toward combining several related operations into a single compact unit has reached the stock preparation equipment industry in the form of the Hydrapulper mixed paper system, developed by the Dilts Machine Works, Fulton, N. Y.

Condensed into the space formerly occupied by a beater only are a junk remover, pumps, classifiner—in fact, a complete pulping and cleaning system. One



TYPICAL INSTALLATION

of the most unique actions is that of the rag catcher, which "twists" together all cellophane, rags, wire, strings, wood, etc., and continuously removes the composite rope thus formed. Heavier material of an undesirable nature is taken away by the junk remover.

Forty-five units of this spectacularly efficient system have already been purchased, indicating ready acceptance by the trade, and users are reporting marked operating economies. These mills also state that they are playing host to a constant stream of persons who are interested in watching the equipment at work.

Pulping of Wheat Straw in the Rod Mill*

By Sidney D. Wells[1] and Pasquale A. Forni[2]

Abstract

The rod mill can be used to carry on pulping of fibrous materials such as wheat straw by the simultaneous mixing, cooking and beating of the chopped material in the presence of sodium hydroxide. Six per cent of alkali, based upon the dry weight of the straw, is sufficient for the pulping action at between 15 and 20% consistency and at temperatures of about 205 deg. F. with a 30-minute treatment in the rod mill; yields of 70% are obtained under these conditions. Substitution of lime for some of the caustic reduced the rate of cooking but gave a pulp with a higher freeness for average strength development and greatly reduced the amount of silica in the recovered soda liquors. The silica content of the waste liquors greatly reduced the amount of settling in the causticizing operation so that the number of washes required in a batch operation would be increased over that of the ordinary causticizing operation.

The pulp obtained in this rod-mill operation is satisfactory for ninepoint corrugating paper; in fact, the bursting strength and the Riehle test are much higher than for a commercial pulp.

The fact that the rod mill is an effective mixing device has not been generally recognized in its application to the beating and refining of paper stock. Wells *(1)* intimated that it could be used as a vessel to carry out exceedingly rapid chemical reactions. Thus, in pulps that require only a softening of the fiber bond without a complete solution of the lignin, and in pulps for coarser grades of paper or paperboard, it is entirely logical to assume that the entire pulping action may be performed in the rod mill with a minimum of time. This conclusion lends itself especially to the use of the rod mill for producing pulps for ninepoint paperboard.

Historical Review

The application of the rod mill *(1)* to the paper industry was first conceived in 1923 *(2)*. It was then proposed as an excellent means for reducing to fiber wood chips, cereal straws, and flax straws after the material had been softened.

In 1930, a patent *(3)* discloses the use of the rod mill as a final digester. Straw was first soaked in cold alkali and this straw, still containing much of the alkaline solution, was fed into a rod mill to complete digestion. In 1931 *(4)* an improvement in this operation was effected. First, the straw was subjected to mild digestion to the point where the bond between the fibers was loosened, then the pulp was washed free of cooking liquors and finally beaten in the rod mill to a degree suitable for board manufacture. The preliminary digestion of annual plants was finally dispensed with and the fibrous material was subjected to the action of alkali directly in the rod mill *(5)*.

To evolve a process whereby pulp can be economically digested in a rod mill necessarily involves a successful recovery of black liquors, especially if sodium hydroxide is to be used as the pulping agent. An immediate difficulty arises in the recovery of straw black liquor on account of their high silica content. On causticization of a recovered ash containing sodium silicate, a bulky, gelatinous precipitate of calcium silicate results. This prevents a rapid settling in the cauticizing tanks and materially reduces the amount of soda that can be recovered from the clear white liquor. Sutherland and Kynaston *(6)* proposed the precipitation of silica by addition of sodium bicarbonate to the solution of the recovered ash; carbon dioxide can also be used. Schacht *(7)*, on the other hand, added lime to the ash in the recovery furnace to form a water-insoluble compound. Rue and Monsson *(8)* claim to have removed some of the difficulties of the recovery operation by using sodium carbonate and sodium sulphite as pulping agents. MacGregor *(9)* replaces a fraction of the soda by enough lime to precipitate most of the dissolved silica during the cooking operation. Peterson and Hixon *(10)* simplify recovery by using aqueous ammonia as a pulping agent and recovering the ammonia by boiling the black liquor and collecting the escaping ammonia gas in water.

Experimental Procedure

The pulping experiments were performed in an experimental Marcy rod mill designed for batch operation. In a typical pulping procedure, the rod mill was first brought to an average temperature of 203 deg. F. by admitting steam through the trunnion of the rod mill drum. After the steam condensate had been drained out, straw was distributed evenly throughout the rods. The caustic cooking solution was poured into the mill through the trunnion and after a few seconds of final steaming to bring the contents to about 203 deg. F., the rod mill was operated for the predetermined pulping time. The rod mill was stopped at 10-minute intervals for observation of temperature and a brief steaming to maintain the temperature above 200 deg. F.

The resulting pulp was washed thoroughly with hot water and used for beater evaluations and pulping yields. The diluted black liquor was saved for causticization experiments on the black ash obtained after evaporation and ignition. This procedure was made to approximate mill conditions and used to study how recovery and settling of white liquors could be accomplished. Black liquors were also analyzed for residual causticity, total alkali, and silica.

Presentation of Data

Several experiments were made to determine the suitability of ammonia as a pulping agent in the rod mill. The pulps obtained, however, were brittle, raw, and short fibered. Presoaking of the straw in ammonia for considerable periods of time failed to produce a pulp of better quality.

It was found that ammonia was not sufficiently

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* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 17-20, 1941.

A portion of a thesis submitted by the junior author in partial fulfillment of the requirements of The Institute of Paper Chemistry for the degree of Master of Science from Lawrence College, Appleton, Wis., June, 1940.

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active to properly pulp straw at room temperature, and elevated temperatures were obviously impractical in an open vessel on account of the volatility of the ammonia. Sodium hydroxide was accordingly chosen as the pulping agent on account of its great activity and relatively low cost.

The first treatment with sodium hydroxide was conducted under the following conditions:

Charge	500 g. chopped straw (moisture-free basis)
Consistency	15%
NaOH	7% of the dry weight of straw
Temperature	131 deg. F.
Duration of milling	20 min.
Black liquor test	68% utilization of NaOH

The pulp obtained was beaten 30 minutes in the laboratory beater during which time the freeness was reduced from 830 to 710 cc. S.-R. Handsheets made from the beaten stock tested as follows:

Basis weight	105 lb. (24x36—500)
Bursting strength	49 points/100 lb.
Average Riehle	15.3 points/100 lb.
Average caliper	10.8 points

The results were quite satisfactory but it was evident that treatment at a higher temperature would make possible more complete utilization of the sodium hydroxide and the possibility of equal pulping action with less chemical. There would be no difficulty in operation continuously in commercial rod mill at temperatures up to 210 deg. F. and the added steam requirement would not seriously affect the cost of the operation. Operation of the laboratory mill at this temperature, however, was not as easy and the runs that follow were made at temperatures ranging between 190 and 205 deg. F. The technique of heating the mill improved as the work progressed so that Runs 6 to 13 averaged above 200 deg. F., while the temperature of the stock in Run 4 dropped to 171 deg. F. at the end of the run, and that in Run 5 to 194 deg. F. at times during the treatment.

In 10 runs the results shown in Table I were obtained. The straw charge for each run was 500 grams chopped straw (moisture-free basis). The characteristics of the experimental mill were as follows:

Length inside	24 in.
Diameter inside	12 in.
Rod charge	220 lb.
Speed of mill	42 r.p.m.

The material was wheat straw grown in Outagamie County, Wisconsin.

Discussion

The data presented in Table I may be divided into three groups, namely:

Group A Varying Duration, Consistency 20%
Cook 6 7 8
Duration ..... 20 min. 30 min. 40 min.
Group B Varying Consistency, Duration 30 min.
Cook 9 10 7 11
Consistency 15% 17.5% 20% 21.5%
Group C Varying Amount of NaOH, Consistency 17.5%
Cook 10 12
Amount NaOH 6% 7%

It is obvious from a study of the results obtained in the runs of Group A that bursting strength was greater the longer the straw was treated in the rod mill at 20% consistency and with the use of 6% sodium hydroxide. On further beating, however, the stock treated 30 minutes in the rod mill developed better than that treated 40 minutes. The Riehle test for stock treated 30 minutes was at a maximum, whether applied to sheets made with or without further beating. The yield of stock obtained was reduced somewhat the longer it was treated. The freeness of stock obtained did not vary to any marked degree.

Study of Series B discloses that maximum bursting strength was obtained by operation at 17.5% consistency. The Riehle test on unbeaten stock, however, was about equal at consistencies ranging from 15 to 20%. On beaten stock the maximum seemed to be obtained with stock treated at 17.5% in the rod mill. There was a marked reduction in values for both bursting strength and the Riehle test for stock treated at 21.5% consistency which prolonged beating did not recover. On the other hand, the sheets made of stock beaten after treatment at 21.5% consistency in the rod mill had much greater bulk than sheets made of any of the other stocks. This property is more desirable in the manufacture of ninepoint corrugating paper than bursting strengths greatly in excess of requirements. The greater bulk combined with the slightly greater yield obtained would warrant serious consideration, especially in view of the fact that the Riehle test was substantially as high as the maximum obtained under other conditions.

Study of Series C discloses a marked increase in the severity of treatment with the increase in caustic soda from 6 to 7%. The bursting strength of the pulps of this series, either with or without beating, was greater than that observed in any other experi-

TABLE I

Run	4	5	6	7	8	9	10	11	12	13	Commercial
Rod Mill Conditions											
Consistency, %	15	20	20	20	20	15	17.5	21.5	17.5	17.5	...
NaOH used, %	5	5	6	6	6	6	6	6	7	4.8	...
CaO used, %	...	...	...	...	...	...	...	...	...	2.6	...
Duration, min.	20	20	20	30	40	30	30	30	30	30	...
Yield, %	73.5	73.0	70.5	66.7	65.8	69.0	70.2	71.3	65.0	75.8	...
Freeness, S.-R., cc.	800	810	580	510	540	500	505	490	460	600	750
Average bursting strength, points/100 lb.	...	...	21.0	33.0	40.7	38.6	36.1	24.2	42.3	27.7	17.9
Average Riehle, points/100 lb.	...	...	9.0	14.1	12.7	14.2	13.1	10.3	15.7	12.4	7.0
Basis weight, 24x36—500 lb./ream	...	...	91.4	92.0	90.9	94.5	94.3	97.6	95.1	89.0	86.8
Average caliper, 0.001 in.		...	11.5	13.4	11.4	10.6	11.8	10.9	10.4	10.4	10.4
Beater Treatments and Tests on Handsheets											
Time in beater	20	45	30	20	20	20	25	20	15	20	30
Freeness, S.-R., cc.	500	400	350	340	350	310	305	345	320	440	530
Average bursting strength, points /100 lb.	47.0	17.5	39.7	55.5	49.0	58.6	57.9	34.1	64.5	41.1	35.3
Average Riehle, points/100 lb.	19.2	10.3	15.3	17.1	16.8	17.3	19.1	16.3	19.0	15.4	10.2
Basis weight, lb./ream	97.9	96.5	86.4	94.0	97.2	95.5	95.3	83.2	94.0	91.0	88.2
Average caliper, 0.001 in.	11.5	13.3	10.0	11.3	11.6	10.2	10.7	10.6	10.1	9.7	9.2
Time in beater	...	70	50	...	...	...	...	35	...	35	45
Freeness, S.-R., cc.	...	300	300	...	...	...	...	310	...	400	310
Average bursting strength, points /100 lb.	...	24.6	54.0	...	...	...	...	39.7	...	48.3	35.6
Average Riehle, points/100 lb.	...	13.3	19.8	...	...	...	...	18.5	...	17.3	13.9
Basis weight, lb./ream	...	98.3	91.0	...	...	...	...	81.6	...	91.5	89.5
Average caliper, 0.001 in.	...	12.0	9.6	...	...	...	...	10.6	...	9.7	8.8

The weight per 1000 sq. ft. is one-third of the basis weight given above.

mental conditions studied. The same results were obtained with the Riehle test. The denser sheet which resulted, however, would counteract the greater strength and this in combination with the greater cost for chemical would discourage further consideration.

Run 13 was made using similar conditions to Run 12 except that 2.6% of caustic lime was substituted for 2.7% of caustic soda. The object of this step was to furnish sufficient calcium to combine with the silica removed from the straw by the sodium hydroxide treatment and so avoid the objectionable formation of sodium silicate in the recovery of the soda. The de- to the extent that use of a consistency of 21.5% retarded pulping. The retardation was to a large extent gree of pulping was decreased by the change but not counteracted by added beating.

The considerable margin between the strength values obtained with the experimental handsheets in this work and commercial straw corrugating paper made it seem advisable to obtain some stock from a commercial operation, treated to the point at which it is passed on to the machine, and make handsheets therefrom in the same manner as was done with the experimental pulps. This was done, and the figures given in the last column of Table I show the results obtained with sheets made from the stock as received and after beating 30 and 45 minutes to reduce the freeness to values approximating those obtained with the other stocks. It is evident that the superior results obtained with the straw treated with sodium hydroxide in the rod mill were caused by the quality of the stock rather than by any benefits obtained by formation of sheets in laboratory equipment.

In Runs 7, 8, and 9 the active alkali consumed amounted to between 96 and 98% of alkali used.

Causticization Studies

Any merits obtained by the use of sodium hydroxide as a pulping agent in conjunction with treatment with rods at elevated temperatures are of no practical value unless the waste liquors can be concentrated, burned, and causticized without encountering serious trouble from the presence of sodium silicate in the liquors derived from the silica which is known to occur in the straw. In other words, recovery is necessary from an economic standpoint. According to numerous references in the literature the use of the conventional soda process on straw is rendered uneconomical on account of this difficulty. There was the possibility, however, that the mild treatment at moderate temperature in the rod mill might dissolve less silica or remove it in such a way that recovery of the soda was not seriously retarded or reduced in efficiency.

TABLE II

Black liquor obtained from Run	10	12		13	
Type of Treatment	6% NaOH	7% NaOH		4.8% NaOH and 2.6% $Ca(OH)_2$	
NaOH used, g.	30	35		24	
Concentration as NaOH during causticization, g./l.	139	108	72	103	50.5
Total alkali expressed as NaOH after causticization, g.	26.4	30.5	31.8	23.5	23.3
Causticity, %	89.0	96.0	96.5	92.0	94.9
Recovery, %	88.0	87.2	90.8	97.9	97.1
Silica in black liquor, %	...	9.20	9.20	3.93	3.93
Silica in green liquor, %	...	4.24	4.24	1.23	1.23
Silica in white liquor, %	...	0.25	0.0	0.0	0.0
Volume of $CaCO_3$ precipitate after settling, % of total vol.	63	81	71	66	45
Volume of Na_2CO_3 solution of equal concentration, % of total vol.	42	52	36	43	29
Time of settling, green liquor, min.	70	20	10.5	35	25
Time of settling, Na_2CO_3 solution, min.	70	30	15	55	35

In view of this situation the black liquors from three of the runs were removed as effectively as possible and were concentrated, incinerated, leached, and causticized. The results shown in Table II disclose the high recovery of soda that can be accomplished with the black liquor obtained in the pulping treatment of straw in the rod mill. The presence of silica is indicated, however, but it is completely removed in the causticization of the green liquors. Over half of the silica in the original black liquor changed to an insoluble form in the recovery furnace. Double salts of sodium and calcium silicate, which would lead to the loss of soda in the lime sludge, do not occur. The presence of silica, however, greatly increases the volume to which the lime sludge will settle and thereby correspondingly reduces the volume of clear liquor that can be removed at each decantation. This factor will increase three times the number of washes necessary to reduce the soda left in the sludge to the amount necessary for efficient recovery. By making use of vacuum filters in conformity with modern practice this objection can be largely avoided. Filters of larger capacity, however, will be necessary to compensate for the slower filtering of the sludge containing silica.

It is known from the relative performance of the laboratory rod mill running batchwise on 500 grams of straw that 15-minute treatment is equivalent to the work done on a flow of 50 tons of straw through a 7 by 16-foot Marcy rod mill per day taking 182 horsepower running load. For larger capacity a 9 by 20-foot Marcy rod mill is available which would have a capacity of 125 tons of straw per day and would consume 350 horsepower running load. In each case two mills in series would be required.

For the purposes of comparison a certain strawboard mill with a daily production of 87 tons had twenty 14-foot globe rotaries, a stock pit about 30 feet wide and 150 feet long, and sixteen 1200-pound beaters equipped with drum washers. Two 9 by 20-foot rod mills and two vacuum filters would make it possible to dispense with the equipment listed. On the other hand, a plant for the recovery of the soda would be required, but such a plant could be housed in a small fraction of the space released and the recovery of the soda would make it possible for the mill to avoid stream pollution in addition to the production of a superior corrugating paper.

Conclusions

The rod mill can be used to carry on the pulping of fibrous plant material such as wheat straw by the simultaneous mixing, cooking, and beating of the chopped material in the presence of caustic soda.

Six per cent caustic soda, based upon the dry weight of the straw, is sufficient for the pulping action at between 15 and 20% consistency and at temperatures of about 205 deg. F. with treatments in the rod mill of 30-minute duration. Under these conditions yields of 70% are obtained.

Treatment at a consistency of 21.5% gave paper of lower bursting and crushing strength but of much lower weight per point and the strength obtained was equal to commercial requirements.

Increase of the sodium hydroxide to 7% increased the degree of pulping with corresponding increase in strength properties and reduction in yield. The increase in strength was not more than could be obtained by the use of more mechanical treatment on the

stock obtained from the use of 6% sodium hydroxide and with greater yield.

Substitution of lime for some of the caustic soda reduced the rate of cooking but gave higher freeness for average strength development and greatly reduced the amount of silica in the recovered soda liquors.

The silica content greatly reduced the amount of settling in the causticizing operation so that the number of washes required in batch operation to give equally complete washing would be greatly increased. Use of vacuum filters would avoid this difficulty and make the operation feasible.

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Meeting Present Day Requirements for Antifriction Bearings on Paper Machinery*

By B. R. Sackett[1] and C. N. Benson[1]

Abstract

The features of the spherical type roller bearing are reviewed and its ability to carry both radial and thrust load in combination pointed out. The various applications of antifriction bearings to the wet end, drier section, and particularly machine calendars, and supercalenders constitutes the presentation. In the case of supercalenders particular emphasis is given to America's largest supercalenders and the mounting designs recommended for calenders of this type. The rest of the paper is devoted to the care and maintenance of antifriction bearings throughout the mill.

It may be interesting to briefly review some facts presented in previous papers before this society as a background for our subject.

In 1924 we presented our first paper, the subject of which was "The Most Efficient Type Of Bearing For Paper Machinery." At that time we compared the operating characteristics of a plain bearing *vs.* ball and roller bearings, traced the manufacturing sequence of antifriction bearings and went into some extended detail on the care and precision involved in producing high-grade accurate antifriction bearings. In that paper the statement was made: "Now why all this discussion about the antifriction bearing on paper machines? The answer is that within a few years, ball and roller bearings will be the standard type of bearing used on paper machines." Obviously, in the light of what has followed since then, this early forecast was well-founded. The remainder of the paper outlined in a general way several major advantages to be derived from the use of antifriction bearings.

The facts presented in 1924 marked the culmination of a decade of cut and try methods coupled with virtually a daily increasing knowledge of the performance of antifriction bearings under all conceivable conditions. During the decade ending in 1934, we find evidence of an ever increasing interest on the part of both mills and paper machinery manufacturers in the application of antifriction bearings. In looking back to ascertain the reason for this, subsequent papers and literature bear such convincing evidence as that found in an old publication issued in 1927, here again I quote:

"The Mechanical Engineer of a larger paper mill states: 'When our No. 7 machine, a 155-inch Fourdrinier was installed four years ago, it came equipped with Skayef Ball Bearings on both constant and variable speed shafts, on table and breast rolls, wire, felt, drier felt and slitter frame rolls, and on wire, press, drier and calender stack drives. In fact, the whole machine was equipped with antifriction bearings except on press and drier rolls. A total of 344 ball bearings are on this one machine. The many operating advantages and the economy of ball bearings were so quickly demonstrated by this machine that we soon equipped No. 6, 110-inch machine with ball bearings on the table rolls, wire rolls, felt rolls, and the constant-speed line shaft, and now have ordered complete equipment for the wet end of No. 5, 90-inch machine. The ball bearings on No. 7 machine have reduced lubricating costs, practically eliminated bearing maintenance, increased the life of wire, and reduced power consumption."

The following tabulation shows the savings effected by ball bearings on no. 7 machine:

Lubrication		
Cost per year with bronze and babbitted bearing:		
6 qt. oil per day × 310 days × 40c per gal.	$ 186.00	
Additional man—310 days × $4.20 per day	1302.00	
		$1488.00
Cost per year on SKF bearings:		
900 lbs. grease × 12c	108.00	
Labor—24 days × $4.40 per day	105.60	213.60
Saving per year		$1274.40
Maintenance		
Cost per year for babbitted bearings on life shafts drives (1 bearing repaired per week):		
Labor to change bearing—4 hr. × 55c	$2.20	
Labor to rebabbitt bearing—8 hr. × $1.00	8.00	
Babbitt metal—15 lb. × 60c	9.00	
Total cost per bearing	19.20	
Total per year—$19.20 × 52 bearings	998.40	
Additional maintenance	200.00	
		$1198.40
Cost per year on SKF bearings:		
5 Table roll bearings × $14.00	70.00	
2 Bearings on constant-speed shaft—× $80.00 —3-yr. life	53.33	
Total including labor		$123.33
Saving per year		$1075.07
Wires		
Average life on no. 6 machine SKF equipped		21 days
Average life on no. 5 machine, bronze busihngs		16 days
Wires per year on above basis:		
310 days—21 days	14.8	
310 days—16 days	19.4	
Difference	4.6 wires	
Saving per year—4.6 wires × $464.75		$2137.85
Power—25% × 180 kw. × 310 days × $.0164		5490.72
Total savings per year		9978.04

Incidentally, the mill from which the above figures

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 17-20, 1941.

[1] SKF Industries, Inc., Philadelphia, Pa.

were compiled has specified antifriction bearings machines since the installation of their first machine about 1924. It's obvious that with savings in the order of $10,000 a year per machine, the investment in antifriction bearings has paid for itself many times over in the ensuing years.

Three years ago, R. H. DeMott presented a paper at the TAPPI Annual Meeting which dealt with some of the more recent improvements in the application of the antifriction bearings to pulp and papermaking machinery. He discussed briefly the relative frictional characteristics of the conventional plain bearing as compared to the antifriction bearing. In addition the paper emphasized the fundamental advantages gained through the use of antifriction bearings on machinery of the type installed in the new sulphate mills built in the south and southeast for the manufacture of sulphate paper from slash pine, and it embraced the application of antifriction bearings to pulp grinders, beaters, jordan engines, press roller, drier cylinders, and the earlier calender stacks.

Self Aligning Bearings

Figure 1 shows the spherical roller bearing construction. The spherical roller bearing is a self-contained unit. It has two rows of barrel-shaped rollers which are slightly smaller at the outside end than at the inboard end. The construction lines 1 and 1 indicate the location of the largest diameter of the rollers. The two tangents, 2 and 3, at the contact surfaces of each roller, at the outer and inner race, respectively, intersect on the axis of the bearing. The Loads A and B resulting from the bearing load are perpendicular with the two tangents and as they are not parallel, they push the roller against the center guide flange. As a result, positive roller guiding and correct rolling is assured. The rollers make line contact on the inner race and under no load point contact on the outer race where Load A is applied. Under normal load, however, this contact is almost the width of the rollers due to the close conformity of roller curvature to the sphere of the outer race. This arrangement prevents overloading of the ends of the rollers and assures maximum bearing capacity. The spherical surface of the outer race is generated from the center of the bearing and affords the bearings its self-aligning characteristics since the rollers are free to move around the surface of the sphere

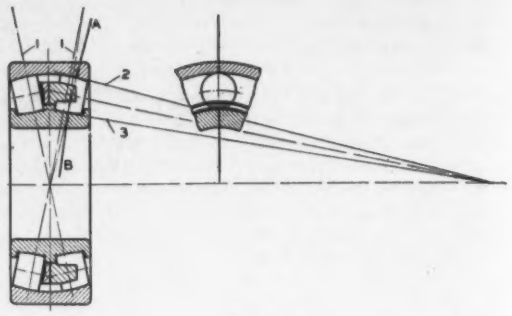

Fig. 1.

without losing their contact and load distribution on the races.

Since the rollers are positively guided by the center guide flange, it is apparent that under load the rollers cannot skew in operation. Skewing causes smearing of the rollers and races and this accounts for premature failure. Another advantage which makes for longer life in this bearing is the fact that the cage is never stressed guiding the rollers but merely acts as a separating medium to keep the rolling elements evenly spaced.

Application of Spherical Bearings

In the last ten years, marked progress has been made in the application of spherical roller bearings to paper mill equipment, and practically all of the old designs which were used in the early days of development have been simplified and improved so that today costs of installation have been materially reduced, where, to all practical intents and purposes, the antifriction bearing is but slightly more expensive than the best plain bearing. There has been developed two standard lines of pillow blocks which, in most cases, can be used without any changes whatsoever in applying spherical roller bearings on paper mill drives, conveyors, barking drums, and in numerous other locations.

Figure 2 shows a section of the SAF-type pillow block which is of the split construction and provides for adequate lubrication of the bearing and incorporates the patented triple seal eliminating the necessity for flingers and simplifies the assembly of the unit. Figure 3 is a similar cross-section view

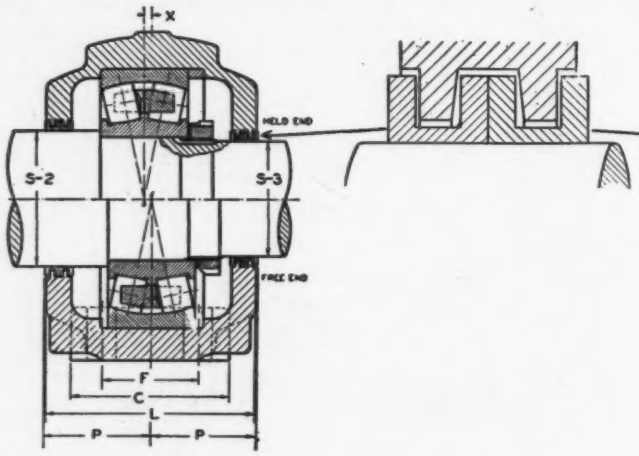

Fig. 2.

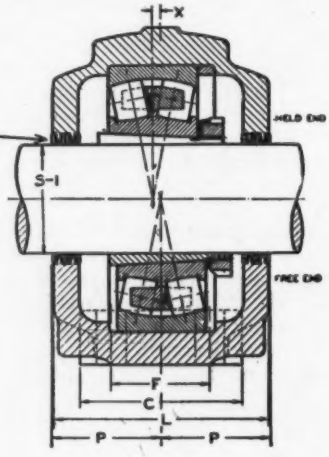

Fig. 3.

of the SDAF type of pillow block embodying all of the same features, but of a considerably heavier construction for applications where the loads are high and shock conditions in excess of normal.

In Fig. 4 is shown the conventional SA pillow block and spherical bearing mounting for the head and tail shafts of log conveyors. There are few parts — the bearing is mounted on an adapter sleeve which fits over the shaft and thus eliminates all machining operations on the shaft. The split construction of the pillow block permits the bearing to be mounted on the shaft in the shop and the entire unit with bearings taken to the conveyor and dropped in place in the pillow blocks.

Figure 5 shows a typical application of pillow blocks and spherical roller bearings employed as the mounting for trunnion rollers supporting a barking drum. This mounting is particularly simple as there is no machining required on the trunnion roller shaft. The bearings are mounted on adapters which are applied directly to the shaft, thus definitely locating the bearing on the shaft. The pillow blocks are slight modifications of standard material and are equipped with flingers, and exclude dirt and foreign material, thus making the housing tight against external influences on the bearings.

A typical mounting for antifriction bearings on chippers is shown in Fig. 6. The design is altered slightly from the standard pillow block mounting, but the general features of the housing are the same as the standard pillow block. Particular attention has been given to the seals in order to exclude all sawdust and other foreign matter from entering the bearing housing. The bearing is mounted directly on the shaft on a tapered seat. Lateral adjustment is provided for and the adjusting rod has provision for shearing in case of a jam or some other cause of trouble which might adversely affect the unit.

During the past few years a number of installations were made on 2-pocket grinders. Figure 7 shows the application to a 2-pocket grinder having a shaft diameter of 13.25 inches. The bearing is a self-aligning roller bearing having a tapered bore mounted on a tapered sleeve. This mounting eliminates expensive shaft shoulders, is simple to install, and easy to remove. The housing is of the conventional split-type pillow block construction and has the labyrinth type of seals and a shroud for providing maximum protection against the intrusion of water. Oil is used as a lubricant and its leakage is prevented by the lip on the inside of the housing end covers as well as by the passages in the labyrinth seal which are filled with a hard fibrous grease.

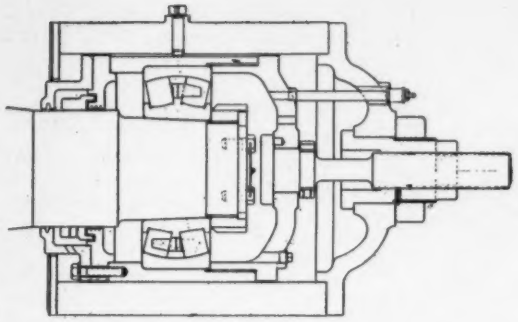

FIG. 6.

Antifriction bearings of this type on pulp grinders allow a material reduction in the width of bearing application for the loads involved, thereby reducing the amount of space required for the complete installation. They keep the stone centrally located with reference to the grinder pockets and permit closer setting of the pockets to the stone.

In the paper presented at the TAPPI Annual Meeting (February, 1939) the drier cylinder mountings were explained in detail. Since that time additional machines have been put into service with the patented drier cylinder mounting shown in Fig. 8 for the drive side and Fig. 9, the rocker mount, on the tending side. Sixteen machines are equipped with these mountings:

Two	212-iuch machines:	Southern Kraft Corporation, Georgetown, S. C.
One	212-inch machine:	St. Joe Paper Company, Port St. Joe, Fla.
One	210-inch machine:	Chesapeake Camp Corporation, Franklin, Va.
One	184-inch machine:	Hollingsworth & Whitney Company, Mobile, Ala.
One	234-inch machine:	Southland Paper Company, Lufkin, Texas.
Three	232-inch machines:	Union Bag & Paper Corp., Savannah, Ga.
One	245-inch machine:	West Virginia Pulp & Paper Company, Charleston, S. C.
One	210-inch machine:	Crossett Paper Mills, Crossett, Ark.
One	194-inch machine:	Champion Paper and Fibre Company, Houston, Tex.
Two	212-inch machines:	Southern Kraft Corporation, Springfield, Ala.
One	170-inch machine:	Berst, Foster, Dixfield Company, Plattsburgh, N. Y.
One	184-inch machine:	Longview Fibre Company, Longview, Wash.

The bearing requirements of calender stacks, and, particularly, supercalenders has increased on account of the demand for better finishes at high speeds. In plain bearings some difficulties were encountered, and therefore the antifriction bearings seem to have some fundamental advantages. The experience gained in a number of changeovers has been particularly advantageous in meeting present-day demands. Antifriction bearings on calender rolls offer

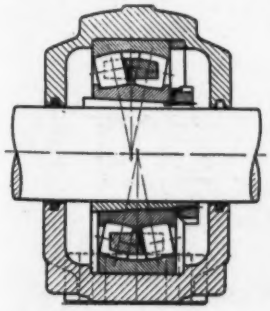

FIG. 4.

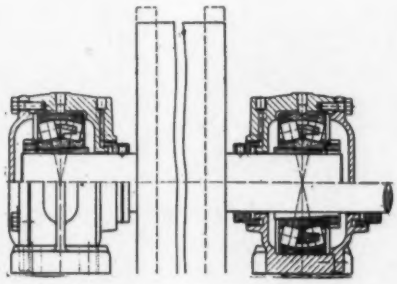

FIG. 5.

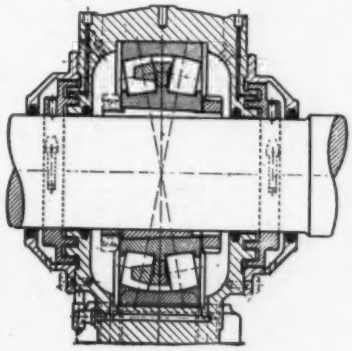

FIG. 7.

three fundamental advantages: (1) reduction in starting torque; (2) maintenance of roll alignment (thereby keeping thrust at an absolute minimum); (3) and reduction in power requirements for the operation of the stack. Obviously, with large plain bearings it is necessary to establish the film under the bearing, and in order to break the metal to metal contact after the calender has been idle for any length of time, it requires an abnormal amount of power. In antifriction bearings the difference between starting and running torque is negligible. Roll alignment is so important that it needs no lengthy comment. With plain bearings this is difficult to maintain due to wear in the bearings.

A slight amount of wear in plain bearings will develop high thrust loads which soon cause trouble due to the resultant wear in the thrust collars. With antifriction bearings the wear is negligible and the internal fit of the bearings is maintained virtually constant throughout the life of a bearing. In the case of plain bearings they must be fitted with suitable thrust washers which because they are vertical in the stack are difficult to keep lubricated and without proper lubrication they tend to wear as well as overheat. As they wear, looseness occurs, and when they overheat, they present a fire hazard. Antifriction bearings, on the other hand, eliminate all of these difficulties.

Figure 10 shows a typical spherical roller bearing mounting for the top roll of a large supercalender. Due to space limitations and high loads it was necessary to design the mounting for two bearings per journal. Equally good results can be obtained with a single bearing mounting provided the space is available. In Fig. 11 is shown the typical mounting for the intermediate rolls and in Fig. 12 the mounting for the bottom roll.

The design and construction of the bottom roll housing provides for lateral expansion and contraction of this roll. The principals employed are similar to that used in drier cylinders, but instead of using three wedged-shaped rockers, only two are required, one on either side of the housing.

Care and Maintenance

We have our attention called frequently to applications of antifriction bearings made 15 to 20 years ago which are still in service, many of these were in the paper industry. We always find that the bearings have been given regular periodic inspection and that they have been adequately lubricated with clean lubricant.

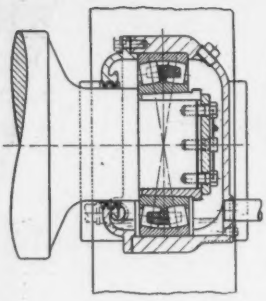

FIG. 11.

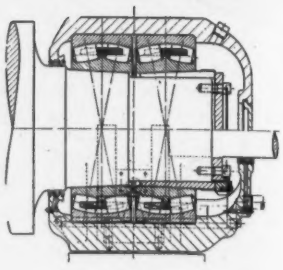

FIG. 12.

Opposed to this we have had cases in recent years where, due to no fault of the bearings, there have been some serious failures because of lubrication troubles. As an example, take the case where a mill has a circulating oil system with the necessary settling tanks and necessary oil purifying equipment. Assume for a moment that due to an oversight or some neglect the settling tanks are not cleaned periodically or possibly the intake for the clean oil becomes clogged or something else happens to it and dirty oil gets into the lines, together with some moisture. Sooner or later the bearings begin to show trouble, and upon examination we find corrosion due to moisture, and pitting of the rolls and races due to dirt. Once this starts it eventually leads to trouble and the replacement of the bearing.

It is equally important where grease is used as the lubricant that the bearings be inspected periodically to make certain water has not collected in the housing, either from leakage or condensation, and that the lubricant is clean. If there is any doubt the housings should be thoroughly cleaned and new clean grease put in.

Reduce Lost Time

In these days when everyone is defense-minded and concentrating on the maximum production, sometimes there is a tendency to put off the customary maintenance or extend the inspection periods. In most cases this makes little difference, but it is all too often the case that when these maintenance periods are neglected the trouble develops, at a time when one can least afford to have it happen. Therefore, we take this opportunity to urge all of the engineers and technicians to maintain their regular schedules, thus insuring themselves and their principals against loss of productive time of the mill equipment.

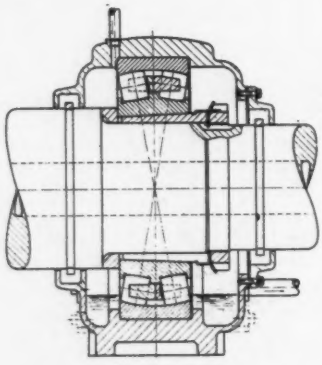

FIG. 8.

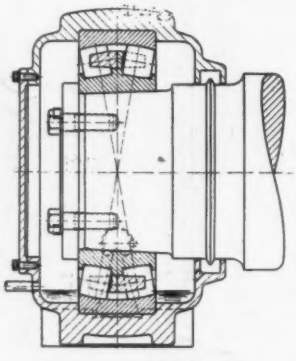

FIG. 9.

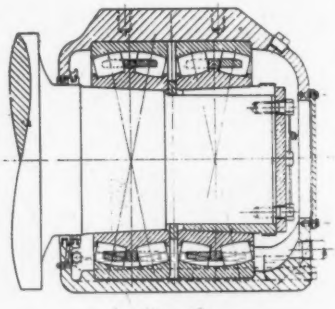

FIG. 10.

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GUMS
SYRUPS
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•

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AMIJEL
FOR THE BEATERS

LAM-O-DEX
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CORAGUM
FOR CORRUGATING

WRITE...

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NEW YORK CITY

"INDEX"
TO
BETTER QUALITY PAPER

FOR

Bleach Preparation
Caustic Extraction in Bleaching
Cooking Wood
De-inking
Digestion of Plant Material
Grinding Wood
pH Control
Size Manufacture

USE SOLVAY CAUSTIC SODA

FOR

*Bleaching Fibres and Pulp
Slime Control
Water Treatment

USE SOLVAY LIQUID CHLORINE

FOR

Adjusting Sulfidity Ratio
Causticizing
Cleaning Floors, Machinery, etc.
Cooking Wood
De-inking
Digestion of Vegetable Material
pH Control
Pitch Removal
Salt Cake Substitute (with gypsum)
Size Manufacture
Water Treatment

USE SOLVAY SODA ASH

•

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FOR TECHNICAL SERVICE . . . In the Solvay laboratories, actual pulp and paper men with years of practical experience in pulp and paper mills study your problems and make sample runs of pulp as the basis for recommendations. *Solvay will be glad to send these pulp specialists into your plant to study actual operating conditions and help adapt laboratory findings to specific plant conditions.* Write today.

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Imports of Paper and Paper Making Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard; Bleached Sulphite More Acute—Some Grades of Old Waste Lower.

Effective September 30, 1939, under Treasury Decision 49,970, all publications, exchanges and trade associations, were denied access to import manifests at the New York Customs House. The Paper Trade Journal and other interested parties have vigorously protested this ruling, and as soon as the order of the Treasury Department is modified or rescinded, full publication of all manifests will be resumed in these columns. In the interim, the Paper Trade Journal is making every possible effort to gather all available information from manifests, at various outside sources.

NEW YORK IMPORTS

WEEK ENDING JUNE 7, 1941

SUMMARY

Cigarette paper.....9 bls., 34 cs.
Newsprint .....18,360 rolls.
Miscellaneous paper.....119 cs.

CIGARETTE PAPER

P. J. Schweitzer, Inc., ——, Fort de France, 9 bls.
Standard Products Corp., ——, Fort de France, 34 cs.

NEWSPRINT

——, ——, Comeau Bay, 2,886 rolls.
H. G. Craig Co., Inc., ——, Donnacona, 341 rolls.
——, ——, Liverpool, N.S., 4,302 rolls.
H. G. Craig Co., Inc., ——, Donnacona, 337 rolls.
——, ——, Cornerbrook, 3,457 rolls.
——, ——, Comeau Bay, 7,037 rolls.

MISCELLANEOUS PAPER

Corn Exchange Bank Trust Co., ——, Kobe, 41 cs.
Japan Paper Co., ——, Kobe, 51 cs.
National City Bank, ——, Kobe, 27 cs.

RAGS, BAGGINGS, ETC.

——, ——, Montevideo, 41 bls. rags.
——, ——, Buenos Aires, 13 bls. rags.
——, ——, Shanghai, 17 bls. rags.
New England Waste Co., ——, Kobe, 100 bls. cotton waste.
Padawer & Co., ——, Bombay, 150 bls. cotton waste.
C. Comiter, ——, Bombay, 100 bls. cotton waste.
Camden Fibre Mills, ——, Bombay, 100 bls. cotton waste.
Hercules Powder Co., ——, Santos, 161 bls. cotton linters.
P. J. Schweitzer, Inc., ——, Havana, 17 cases waste paper.
——, ——, Havana, 8 bls. rags.
J. Levy & Son, ——, Havana, 28 bls. rags.

HIDE GLUE

Prague Credit Bank Agency, ——, Buenos Aires, 100 bags.

CASEIN

Trans-Atlantic Animal By-Products Corp., ——, Buenos Aires, 303 bags.
H. S. Cramer & Co., Inc., ——, Buenos Aires, 2,012 bags.
Eugenio Lang, Inc., ——, Buenos Aires, 1,600 bags.
Casein Co. of America, Inc., ——, Buenos Aires, 2,493 bags.
A. Hurst & Co., Inc., ——, Buenos Aires, 1,418 bags.
W. M. Allison, ——, Buenos Aires, 84 bags.
——, ——, Buenos Aires, 16 bags.
Kurt Fleischner, ——, Buenos Aires, 834 bags.
American Cyanamid & Chemical Corp., ——, Buenos Aires, 834 bags.
Casein Co., of America, Inc., ——, Buenos Aires, 1,020 bags.
Chase National Bank, ——, Buenos Aires, 425 bags.
Casein Co., of America, Inc., ——, Buenos Aires, 850 bags.
National City Bank, ——, Buenos Aires, 250 bags.

BOSTON IMPORTS

WEEK ENDING JUNE 7, 1941

——, ——, Santos, 1,117 bags bone residue.

LOS ANGELES IMPORTS

WEEK ENDING JUNE 7, 1941

——, ——, Kobe, 3 cs. filter paper.
——, ——, Shanghai, 520 bls. rags.
——, ——, Osaka, 4 cs. stencil paper.
——, ——, Yokohama, 3 cs. rice paper.
——, ——, Tokyo, 3 cs. hanging paper.
——, ——, Powell River, 1,891 rolls newsprint; 467 bls. sulphite pulp, 90 tons; 181 pkgs. paper stock.

Forge Hill Paper Mill Burned

MOODNA, N. Y., June 9, 1941—The historic paper mill on Old Forge Road was burned May 29. Estimated loss in machinery, stock and buildings is $150,000. The interior of the mill had just been newly painted.

"This was the second fire at the mill this year," says the *Newburgh News* "a blaze having caused some damage early in January. This fire, however, has crippled the plant completely, and it is doubtful if it will be rebuilt this year, if at all. It has been known as the Cornwall Division of the Rondout Paper Mills, with the main and purchasing office in Napanoch, and is owned by William P. Kelly of East Orange, N. J., with James Suter as general manager of the local plant.

"About 70 persons have been employed by the mill, many being on the night shift. It is reported that work has been exceptionally good the past few months, resulting in increases in pay for the entire personnel last week."

End Labor Dispute at Osborne Plant

INDIANAPOLIS, Ind., June 9, 1941—A labor dispute of three weeks' standing at the plant of the Osborne Paper Company in Marion, Ind., was ended last week when the management and 200 employees reported they had reached an agreement. Neither circumstances back of the dispute, which led to cessation of operations at the plant, nor terms of the settlement, were announced. At the start of the strike, employees contended they had been locked out of the plant and the management contended it was a strike.

Rockport Mill Starts

ROCKPORT, Ind., June 9, 1941—The local strawboard factory, owned by the Chillicothe Realty Company, Chillicothe, Ohio, has begun operations following several weeks of preliminary reconditioning of equipment. The factory employs about 55 men. The realty company several years ago bought the property from the Mead Paperboard Company. Charles E. Burgess is general mill superintendent.

NELIO PURE GUM ROSIN and Rosin Size

Two thoroughly dependable gum rosin products made by modern scientific methods and free from the faults of ordinary gum rosin.

Investigate NELIO. In addition to its outstanding qualities of performance, its superior virtues offer economies in handling.

NELIO IS UNIFORM—Standard grades never varying in color and quality from drum to drum or shipment to shipment.

NELIO IS BRILLIANT—Assuring lighter grades of paper.

NELIO IS DRY—The turpentine content is extremely low.

NELIO IS CLEAN—Absolutely free of dirt and foreign matter. Manufactured in stainless steel equipment.

NELIO IS FULL WEIGHT—Shipped in standard, non-absorbent leak-proof metal drums, in 100-lb. net weight paper bags or in fluid state in insulated tank cars. Nelio Rosin size is shipped in liquid state in drums or tank cars.

NELIO TECHNICAL SERVICE—Consulting service by experienced paper technicians is available to paper mills on request.

Write for samples and prices.

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NELIO RESIN PROCESSING CORPORATION

JACKSONVILLE FLORIDA

Sold by

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Pure Titanium Dioxide

UNITANE-O

A brilliantly WHITE, pure, fine titanium dioxide possessing excellent . . .

- **OPACITY**
- **BRIGHTNESS**
- **DISPERSION**

Suitable for ALL types of paper ranging from thin printing papers and waxing tissues to coated book and magazine stocks.

UNITANE O—110 was especially developed for paper pigmentation. Its excellent dispersion in water promotes good retention and excellent sheet formation. As a component of the beater furnish, it produces *whiter* sheets of *great brilliance,* and superior printing qualities.

SAMPLES of UNITANE O-110 will be sent promptly upon request.

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UNITED COLOR AND PIGMENT CO.

DIVISION OF INTERCHEMICAL CORPORATION
NEWARK, NEW JERSEY

SALES OFFICES IN PRINCIPAL CITIES

New York Paper and Pulp Market Review

Paper Market Strong With More Active Buying In Minor Grades And In Some Specialties — Pulp Market Strong With Bleached Kraft Becoming More Scarce—Rag and Paper Stock Prices Firm.

Office of the PAPER TRADE JOURNAL,
Wednesday, June 11, 1941.

Sales volume continues to be maintained at a high level in this area and in most other leading centers throughout the country. Reports from many manufacturers' representatives, jobbers, and general paper merchants during the week indicate that demand is broadening out and that sales of items normally in less extensive use are steadily increasing.

The index of general business activity rose to a new high mark of 129.0% for the week ended May 31, from 128.4% for the preceding week, compared with 105.8% for the corresponding week last year. Paper board production advanced 8.7%.

Paper production for the holiday week ended May 31, was estimated at 97.7%, compared with 87.6% for 1940, with 73.9% for 1939, with 62.5% for 1938, and with 85.3% for the corresponding week for 1937.

Paper board production for the week ended May 31 was 84.0%, compared with 77.0% for 1940, with 59.0% for 1939, with 48.0% for 1938, and with 76.0% for the corresponding week for 1937.

The current heavy demand for paper and paper board is generally viewed in the trade as contributed by forward buying prompted by the fear that adequate supplies may not be readily obtainable in the future. A heavy consumer demand, based upon the great utility and new uses of paper and paper products, is the solid foundation for the active paper markets today.

In a letter to executives of the paper and pulp industry, John L. Reigel, president of the American Paper and Pulp Association, said that the country is faced with a shortage of railroad cars in the present emergency. He suggested that it is important to fully utilize the existing car supply. Cooperation is therefore desired to prevent a severe car shortage. Purchasing agents may aid by cooperating with suppliers to have cars loaded to practical capacity. Plant managers should make certain that cars are not used for storage, and cars should be loaded and unloaded with minimum delay. Sales departments should cooperate with customers to increase the amount of paper loaded in each car to the maximum practical capacity.

With the announcement of Southern Kraft Corporation last week that its prices of kraft liner board would be advanced to $60 per ton for the third quarter, future prices of this item will probably be stabilized at this level for the remainder of the current year.

Demand for non-durable goods, including paper, according to the Department of Commerce, for April, rose to an index level of 136 to 144, while orders for durable goods declined. The index value of all industries for non-durable goods was 112.1; paper and allied products, 111.1. The index value of manufacturers' shipments of paper and allied products was 161, compared with 124 for April, 1940.

The market situation in paper and paper products continues very strong. The heavy demand continues to exert pressure to advance prices, but any increases which may occur in the third quarter will be effected to establish a more equitable balance between the prices of pulp and the finished paper products. Advances of from $5 to $15 per ton do not appear unreasonable and seem justifiable by rising costs. Prices are firm and the average representative quoted market prices are unchanged at this date.

Chemical Pulp

Chemical wood pulp continues to reflect a strong market position, with paper mills averaging production at over 99%. Unbleached sulphite is rather scarce, with unbleached kraft pulp also reported more difficult to obtain. No shortage, however, exists, and increased domestic and Canadian production is expected to reasonably well meet actual needs. Prices for the third quarter, on contracts, remain unchanged.

Rags

The market situation in new cotton rags is firm and mill buying is reported sufficiently active to maintain a strong market, with trading quite well distributed among the paper-making grades. Prices are unchanged.

Old Rope and Bagging

Limited supplies of old Manila rope, with good mill demand, continues to exert steady pressure for higher prices. This market is, therefore, very firm, with more strength shown at this date in jute strings. No change from representative average market quotations has been reported at this date.

Demand for scrap bagging is reported heavy at this date, with supplies limited and inadequate to meet mill demand, according to some quarters of the trade. It is the general expectation in this market that the current strong situation in gunny, with importations very light, is likely to advance prices above prevailing quotations. No important change, however, has been reported at this date.

Old Waste Paper

Heavy mill buying has created a firm paper stock market. To conserve supplies under the present emergency, it has been suggested by one large board manufacturer, that it may be well to take steps to save old waste paper, stop mixing it with other household and office waste and discontinue burning it in private incinerators. No. 1 mixed and old corrugated are very firm this week and while some advances are expected in some quarters of the market, no important change from prevailing representative quotations has been reported at this date.

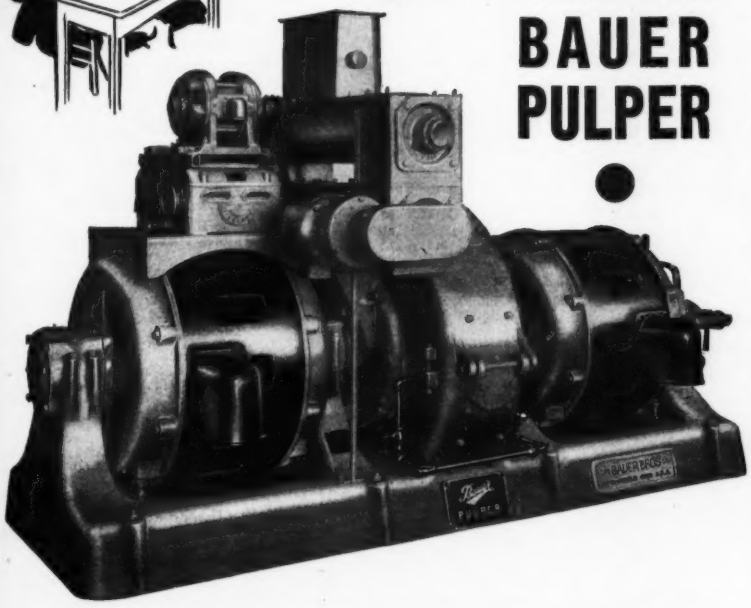
Twine

High sales volume is reported in many grades of twine this week. Cordage mills are now operating at the highest production ratio on record. Decreasing supplies of Manila and jute fibers have increased the use of cotton fiber for a wide variety of uses. Prices are firm and unchanged.

Information, please!

ABOUT THE

BAUER PULPER



Q. What is its operating principle?

A. Double-disc action! It rubs, rolls, and squeezes the fibres with minimum cutting and shortening.

Q. How does a Bauer pulper improve finished stock?

A. Results show it produces high mullen and tensile, improved freeness and formation, and fine tear and fold.

Q. What particular pulping job is the specialty of the Bauer pulper?

A. It has no specialty. By changing disc patterns, it is efficient on kraft knotter and screen rejects, semi-chemical and semi-sulphite pulps, ground wood screenings, boxboard, container, and wallboard.

Q. Is there more than one size?

A. Yes, in the 36" and 24" diameter disc sizes. There is also a full range of plate patterns. And here's a question for you: Why not write today for details?

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ZOPAQUE RG

Pure TiO_2

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The Chemical & Pigment Company
Baltimore, Md. · Collinsville, Ill. · Oakland Calif.
Manufactured by
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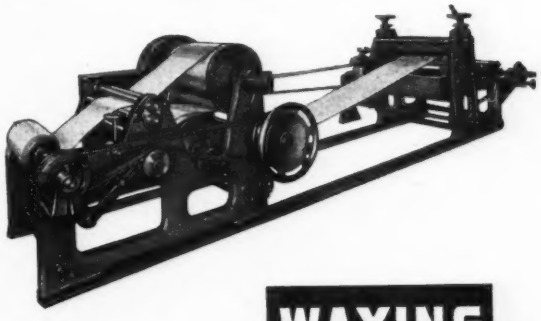
No. AW-2 WAXING MACHINE



WAXING *Machine*

One of our several types of waxing units used in many production plants at home and abroad. Produces either wet or dry wax paper or light weight board. Perfect controls for temperature, degree of application, accurate rewind and a superior product. In writing refer to No. AW-2.

HUDSON-SHARP
MACHINE CO • GREEN BAY • WIS

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, June 11, 1941.

BLANC FIXE—Quotations on blanc fixe are firm and continued unchanged at prevailing market levels. Demand reported steady for the week. The pulp is currently quoted at $35 per ton in barrels, at works; the powder is offered at $50 per ton, f.o.b., works.

BLEACHING POWDER—Prices on bleaching powder are firm with shipments reported in higher volume for the week. Bleaching powder is currently quoted at $2 per 100 pounds, in drums, at works.

CASEIN—Quotations on casein are reported firm. Demand steady for the week. Standard domestic casein, 20-30 mesh, is currently quoted at 20 cents per pound; 80-100 mesh, at 20½ cents per pound; all prices in bags, car lots. Standard Argentina casein is currently offered at 19 cents per pound. No quotations on French casein.

CAUSTIC SODA—Prices on caustic soda are unchanged. Demand reported heavy for the week. Solid caustic soda is currently quoted at $2.30 per 100 pounds, flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay are firm and continue unchanged this week. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay at from $12 to $22 per ton, at mines. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—The demand for chlorine is reported good. Prices are firm and the market strong for the current week. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—Quotations on most grades of rosin are lower for the week. "G" gum rosin is currently quoted at $1.86 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at $1.86 per 100 pounds, in barrels, New York. Seventy per cent gum rosin size is quoted at $2.55 per 100 pounds f.o.b., works.

SALT CAKE—Prices on salt cake are firm. Demand good, market strong, with current quotations nominal. Domestic salt cake is currently quoted at $17 per ton in bulk; chrome salt cake at $16 per ton. All prices in car lots, f.o.b., shipping point. The quotation of $16.50 per ton on imported salt cake continues nominal.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market quotations. Shipments reported steady. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch are firm and continue unchanged for the current week. Pearl is currently quoted at $3.10 per 100 pounds; powdered starch at $3.20 per 100 pounds; all prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Shipments reported in good volume for the week. The commercial grades are currently quoted at $1.15 per 100 pounds; iron free at $1.60 per 100 pounds, in bags, car lots, f.o.b., works.

SULPHUR—Prices on sulphur are firm and continue to conform to prevailing market quotations. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $19 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $15 to $21 per ton, at mills. No quotations on imported talc.

MARKET QUOTATIONS

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Delivered Zone A			
Northern, Extra Quality	$5.25	@	$6.00
Superstandard	4.87½	"	5.25
Northern Standard Wrapping	4.50	"	5.00
Standard Wrapping	4.50	"	—
Tissues—Per Ream—Carlots			
White No. 1	.97½	"	—
White No. 1 M. G.	.95	"	—
White No. 1½	.80	"	—
White No. 2	.75	"	—
Anti-Tarnish M. G.	.80	"	—
Colored	.85	"	—
Kraft	.87½	"	—
Manila	.77½	"	—
Unbl. Toilet, 1 M.	3.75	"	—
Bleached Toilet	5.26	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.10	"	—
Bleached, Jr.	3.60	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	8.75	@	10.75
No. 1 Manila Wrapping, 35 lb.	5.50	"	5.75
No. 2 Manila Wrapping, 35 lb.	5.25	"	5.50
Boards, per ton—			
News	45.00	@	—
Chip	45.00	"	—
Sgl. Mla. Ll. Chip	60.00	"	—
White Pat. Coated	75.00	"	—
Kraft Liners	55.00	"	—
Binders Boards	80.00	"	—

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds			Ledgers		
100% Rag Ext. No. 1	$39.10	@	$46.00	$40.25	@	$47.25
100% Rag	31.05	"	36.50	32.20	"	37.75
85% Rag	....	"	....	29.90	"	35.00
75% Rag	23.60	"	27.75	24.75	"	29.00
65% Rag	....	"	....	21.65	"	26.25
50% Rag	17.55	"	21.50	18.70	"	22.75
25% Rag	14.65	"	17.75	15.80	"	19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds			Ledgers		
No. 1	$9.35	@	$11.50	$11.55	@	$12.75
No. 2	8.50	"	10.25	9.65	"	11.75
No. 3	8.05	"	9.25	9.20	"	11.25
No. 4	7.70	"	9.50	8.90	"	10.75

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper.

Delivered in Zone 1:

No. 1 Glossy Coated	$11.90	@	$13.50
No. 2 Glossy Coated	10.35	"	11.75
No. 3 Glossy Coated	9.55	"	11.00
No. 4 Glossy Coated	9.15	"	10.50
No. 1 Antique (watermarked)	9.05	"	10.50
No. 2 Offset	8.40	"	9.75
A Grade E. F.	8.20	"	9.50
A Grade S. & S. C.	8.45	"	9.75
B Grade E. F.	7.65	"	8.75
B Grade S. & S. C.	7.90	"	9.00
C Grade E. F.	7.35	"	8.50
C Grade S. & S. C.	7.60	"	8.75
D Grade E. F.	7.10	"	8.25
D Grade S. & S. C.	7.35	"	8.50

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	No prices		
Dry	No prices		
(Delivered)			
No. 1 Domestic and Canadian	40.00	@	42.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	3.72½	@	3.87½
Prime Qualities—			
Easy-Bleaching Sulphite	3.17½	"	3.75
Strong Unbleached Sulphite	3.17½	"	3.75
News Grade, delivered			
Unbleached Sulphite	61.00	"	64.25
(On Dock, Atlantic Ports)			
Kraft Bleached	4.12½	"	—
Kraft Light & Strong	3.75	"	4.15
Kraft No. 1	3.60	"	4.00
(F. o. b. Pulp Mill)			
Kraft Domestic and Canadian	2.75	"	3.37½
(Delivered)			
Soda Bleached	3.30	"	—

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1.	6.00	@	6.25
Silesias No. 1	4.25	"	4.50
New Unbleached	6.00	"	6.25
Blue Overall	4.25	"	4.75
Fancy	2.25	"	2.50
Washables	2.00	"	2.15
Mixed Khaki Cuttings	2.50	"	2.75
O. D. Khaki Cuttings	3.00	"	3.15

Old Rags

White, No. 1—			
Repacked	3.10	"	3.35
Miscellaneous	2.35	"	2.65
White, No. 2—			
Repacked	2.50	"	2.75
Miscellaneous	2.00	"	2.25
Thirds and Blues—			
Repacked	1.25	"	1.35
Miscellaneous	1.10	"	1.25
Roofing Rags—			
No. 1	1.30	"	1.35
No. 2	1.20	"	1.25
No. 3 (bagging)	.95	"	1.00
No. 4	.90	"	.95
No. 5A	.90	"	.95

Foreign Rags

All prices nominal.

New Rags

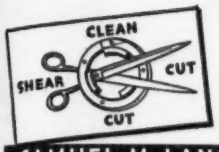
New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—

Langston

SLITTERS & ROLL WINDERS



Will stand up under heavy service and deliver clean rolls of uniform density from all grades of paper and paperboard. A size and type for every need.

SAMUEL M. LANGSTON COMPANY, *Camden, N.J.*

WATERBURY FELTS

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ORISKANY, NEW YORK

S.W.W.
BEATER TACKLE

● If you feel a special bed plate or beater bar will solve a beating problem, ask our engineers for their assistance. They know beater tackle—can help you choose a special or standard design from the complete SWW line.

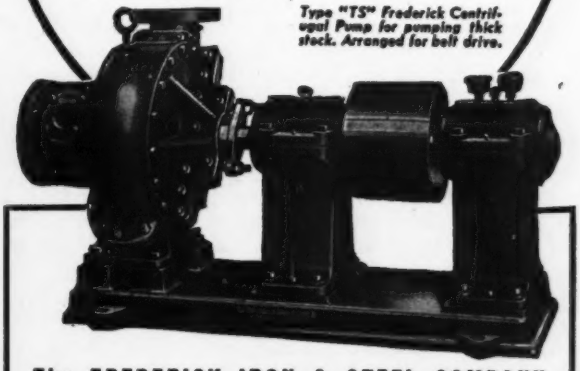
SIMONDS WORDEN WHITE CO.
DAYTON, OHIO

Frederick
STOCK PUMPS

Extra heavy shafts made of chrome heat-treated steel are carried in long babbitted sleeve bearings arranged for ring oiling . . . Non-clog impeller wheel is specially designed to permit easy flow of heavy stock . . . Patented adjustable liner plates on front and rear sides of the impeller make adjustment or replacement easy . . . Extra long packing box houses twice the usual number of rows of packing.

These are just a few of the special FREDERICK features you will want to know all about. Write for detailed data . . . no obligation. See why FREDERICKS can be guaranteed to meet the operating conditions for which they are sold!

Type "TS" Frederick Centrifugal Pump for pumping thick stock. Arranged for belt drive.



The FREDERICK IRON & STEEL COMPANY
FREDERICK, MARYLAND

FULTON DRYER DRAINAGE SYSTEMS

For substantial improvements in your drying conditions at unusually low cost. Write for details today.

THE MIDWEST-FULTON MACHINE CO.
Dayton, Ohio

CLINTON

STARCHES

SPECIAL GRADES FOR BEATER AND TUB SIZING

QUALITY SERVICE

CLINTON COMPANY
CLINTON, IOWA

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	"	4.75
No. 2 White Cotton.	3.25	"	3.75
No. 3 White Cotton.	2.50	"	3.00
No. 4 White Cotton.	1.90	"	2.20
Extra Light Prints..	2.00	"	2.40
Ord. Light Prints...	1.75	"	2.15
Med. Light Prints...	1.55	"	1.95
Dutch Blue Cottons.	2.25	"	2.50
French Blue Linens.	3.00	"	—
Checks and Blues...	2.00	"	—
Linsey Garments....	1.90	"	2.00
Dark Cottons.....	1.50	"	1.60
Old Shopperies.....	1.30	"	1.45
New Shopperies.....	1.45	"	1.50
French Blues.....	2.25	"	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	4.15	@	4.25
Wool Tares, light....	2.50	"	2.75
Wool Tares, heavy..	2.50	"	2.75
Bright Bagging.....	3.15	"	3.30
Manila Rope—			
Foreign	5.50	"	5.75
Domestic	5.50	"	5.75
Jute Threads.....	2.75	"	3.00
Sisal Strings	2.10	"	2.35
Mixed Strings.....	1.10	"	1.20

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	3.10	@	3.25
Ordinary Hard White No. 1....	2.75	"	3.00
Soft White No. 1..	2.35	"	2.50
Soft White Extra..	2.70	"	2.85
Flat Stock—			
Stitchless	1.10	"	1.25
Overissue Mag.....	.90	"	1.00
Solid Flat Book...	.90	"	.95
Crumbled No. 1 ..	.70	"	.75
Ledger White Stock.	1.65	"	1.75
Ledger Stock Colored	1.20	"	1.30
Manila—			
New Env. Cut....	1.70	"	1.80
New Cuttings.....	1.80	"	1.90
Old Kraft Machine Compressed bales..	1.35	"	1.50
News—			
No. 1 White News	1.50	"	1.60
Strictly Overissue..	.96	"	1.00
Strictly Folded....	.60	"	.65
Corrugated	.67½	"	—
No. 1 Mixed Paper..	.52½	"	—

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.19½	@	—
White Hemp	.19½	"	—
Fine Polished—			
Fine India.....	.22½	"	—
Unpolished—			
Box	.15¾	"	—
Paper Makers.....	.15½	"	—
Tube Rope.....	.16¾	"	—
Wall Paper.....	.19¼	"	—
Wrapping	.19½	"	—
Soft Fiber Rope...	.17½	"	—
Cotton	.24	"	—

(Hard Fiber)

Medium Java.....	.12	"	—
Mex. Sisal.....	.11	"	—
Manila	.25	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White No. 1.	.06½	@	.06¾
New White No. 2.	.03½	"	.04
Light Silesias.....	—	"	.04½
Silesias, No. 1....	—	"	.04
Black Silesias, soft	—	"	.03
New Unbleached..	.06¼	"	.06½
Washable Prints..	.02½	"	.03
Washable No. 1..	—	"	.01½
Blue Overall.....	.04	"	.04½
Cottons—According to grades—			
Washable shredding	—	"	.01¾
Fancy Percales....	.03	"	.03¼
New Black Soft...	.02½	"	.02¾
New Light Seconds	—	"	.04
New Dark Seconds	—	"	1.50
Khaki Cuttings—			
No. 1 O. D.....	.03	"	.03¼
No. 2 Mixed.....	.02	"	.02¼
Corduroy	.01¾	"	.01½
New Canvas.....	.04½	"	.05
New Black Mixed.	—	"	.02¼

Domestic Rags (Old)

White No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.75	"	3.00
Thirds and Blues—			
Miscellaneous	1.35	"	1.50
Repacked	1.55	"	1.65
Black Stockings (Export)	Nominal		
Roofing Stock—			
Foreign No. 1....	Nominal		
Domestic No. 1...	1.30	"	1.35
Domestic No. 2...	1.10	"	1.15
Roofing Bagging..	1.00	"	1.05

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	3.25	@	3.75
Domestic	3.00	"	3.25
Manila Rope.....	—	"	5.50
Sisal Rope.....	2.00	"	2.25
Mixed Rope.....	.75	"	1.00
Scrap—			
No. 1.....	3.00	"	3.25
No. 2.....	—	"	1.50
Wool Tares, heavy..	3.75	"	4.00
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.25	"	3.50

Old Papers

(F. o. b. Phila.)

Shavings—			
Hard White Special	2.75	@	2.85
Hard White.....	2.50	"	2.60
No. 1 Soft White..	2.00	"	2.25
No. 2 White.....	1.85	"	1.90
No. 1 Mixed.....	1.00	"	1.20
Solid Ledger Stock..	1.90	"	2.00
Ledger Stock, white.	1.60	"	1.75
Ledger Stock, colored	1.30	"	1.40
No. 1 Books, heavy..	.95	"	1.00
Manila Cuttings.....	1.90	"	2.00
Print Manila.....	.60	"	.65
Container Manila....	.50	"	.55
Kraft Paper.....	1.40	"	1.45
No. 1 Mixed Paper..	.60	"	1.75
Straw Board Chip...	.50	"	.60
Binders Board Chip..	.50	"	.60
Corrugated Board....	.80	"	.95
Overissue News.....	.85	"	.90
Olds Newspapers....	.85	"	.90

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	3.15	@	3.25
No. 1 Soft White	2.50	"	2.75
No. 2 Mixed.....	.90	"	1.00
Solid Ledger Books..	2.00	"	2.10
Overissue Ledger Stock	1.75	"	2.00
White Ledger Stocks	1.50	"	1.65
Mixed Ledgers	1.25	"	—
No. 1 Heavy Books	1.10	"	1.20
No. 1 Books, Light..	.75	"	.85
Crumpled Stitchless Book Stock	1.15	"	1.20
Manila Env. Cuttings	3.00	"	3.25
Manila Envelope Cuttings, extra quality	2.75	"	3.00
White Blank News..	1.70	"	1.80
No. 1 Kraft.....	1.35	"	1.45
Extra No. 1 Kraft..	1.75	"	—
Mixed Papers.....	.50	"	—
Print Manila.....	.70	"	—
Container Manila....	.65	"	.75
Old Newspapers.....	.62½	"	—
Paper Wool Strings.	.95	"	1.15
Overissue News.....	.65	"	.70
Box Board Chips....	.35	"	—
Corrugated boxes....	.65	"	.75
Kraft corrugated boxes	1.20	"	1.25
New Kraft Corrugated Cuttings	1.75	"	2.00
Screening Wrappers.	.85	"	.90

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	3.75	@	4.00
Sisal Rope.....	2.60	"	2.75
Mixed Rope.....	.85	"	1.00
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Soft Jute Rope.....	4.25	"	4.75
Manila Rope—			
Foreign .....(nominal)			
Domestic	5.75	"	6.00
Jute Carpet Threads.	3.00	"	3.25
Bleachery Burlap....	5.00	"	5.50
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.25	"	3.75
Scrap Sisal.....	2.75	"	3.00
Scrap Sisal for Shredding	2.75	"	2.90
Wool Tares—			
Foreign	(nominal)		
Domestic	2.85	"	3.00
Aust. Wool Pouches.	3.50	"	3.75
New Burlap Cuttings	4.00	"	4.25
Heavy baling bagging	3.25	"	3.50
Paper Mill Bagging..	2.75	"	3.00
No. 2 Bagging.....	.75	"	.80

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	—	@	.03
Fancy Percales....	.03¾	"	4.00
New White No. 1.	.06	"	.06¼
New Light Flannelettes	.03¾	"	4.00
Canton Flannel, Bleached	.06	"	.06¼
Underwear Cutters, Bleached	.06¼	"	.06¾
Silesias No. 1.....	.04	"	.04¼
New Black Silesias..	4.00	"	—
Red Cotton Cuttings	.04	"	.05
Soft Unbleached....	.06	"	.06¼
Blue Cheviots.....	.04¼	"	.04½
Fancy	.01½	"	.01¾
Washable	.01½	"	.01¾
Cottons—According to Grades—			
Blue Overalls.....	.04	"	.04¼
New Black, Soft..	.03	@	.03¼
Khaki Cuttings.....	.02	"	.02¼
O. D. Khaki.....	.02½	"	.03¼
Corduroy	.02	"	—
New Canvas.....	.05½	"	—
B. V. D. Cuttings...	.06	"	.06¼

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	2.75	@	3.00
Miscellaneous	2.00	"	2.25
White No. 2—			
Repacked	1.90	"	2.00
Miscellaneous	2.00	"	2.25
Twos and Blues.....	2.00	"	2.25
Old Blue Overalls...	1.60	"	2.00
Thirds and Blues....	1.25	"	—
Miscellaneous	1.25	"	1.35
Black Stockings.....	3.50	"	4.00
Roofing Stock—			
No. 1.....	1.20	"	1.25
No. 2.....	.95	"	1.00
No. 3.....	.85	"	.95

Foreign Rags

(F. o. b. Boston)

Canvas .....(nominal)	
Dark Cottons.....(nominal)	
Dutch Blues.....(nominal)	
New Checks and Blues(nominal)	
Old Fustians.....(nominal)	
Old Linsey Garments.(nominal)	
New Silesias.....(nominal)	

CHICAGO

Waste Paper

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings....	3.15	@	—
No. 1 Hard White	2.50	"	2.65
No. 1 Soft White.	2.00	"	2.20
Ledger and Writings	.85	"	.95
Solid Books.....	.83	"	—
Blanks	1.45	"	—
Krafts	1.40	@	1.50
New Kraft Cuts....	1.60	"	1.75
Overissue News.....	.00	"	—
Old Newspapers—			
No. 1 Folded News	.70	"	.80
No. 1 Mixed Paper	.45	"	—
Roofing Stocks—			
No. 1.....	.95	"	1.00
No. 2.....	.85	"	.90

Honor Training Course Graduates

The Dunn Sulphite Paper Company and Port Huron Sulphite and Paper Company, were hosts at the second annual pulp and paper vocational training dinner Monday night, June 2, Black River Country club, Port Huron, Mich., at which 80 employees of the two companies who have been enrolled in a 36 weeks vocational education class were honored. Executives and foremen of the two companies and representatives of the board of education, which sponsored the training program, also attended.

Dr. Frank W. Dalton, Lansing, chief of the trade and industrial education division of the state board of control for vocational education, spoke briefly. He discussed the various divisions of vocational education and the Michigan program for national defense training.

Certificates of achievement, issued by the state board, were presented to the 80 members of the class by Dr. George Waters, president of the school board. Francis Kiefer, vice president of Port Huron Sulphite and Paper Company, presented 56 volumes of technical books to 26 employees of his firm and George C. Dunn, secretary-treasurer of the Dunn Company, presented 30 volumes of the books to 14 employees of his company. These presentations were made in recognition of fulfillment of certain special requirements in the training program.

Raymond J. Johnson, speaking for the Dunn employees, and Olin O. Henry, speaking for the Port Huron Sulphite workers, expressed appreciation to the firms. On behalf of members of the class and the supervisory forces of both companies, Gerald R. Boyd presented a movie camera to Wilbur L. Cassiday, instructor in the course. Mr. Cassiday responded briefly.